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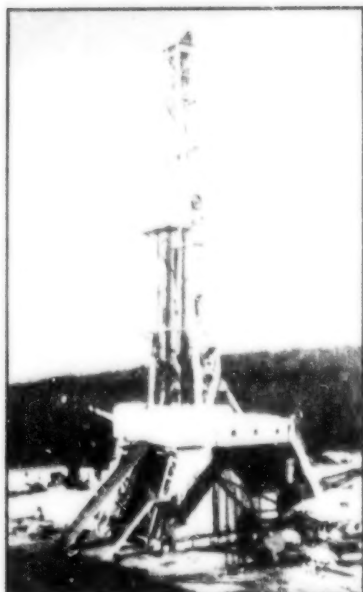
U.S. Department of the Interior
Bureau of Land Management

Jackson District
Eastern States

June 1995



Florida Resource Management Plan and Record of Decision



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The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based on the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation; rangelands; timber; minerals; watershed; fish and wildlife; wilderness; air; and scenic, scientific, and cultural values.

On cover, from upper right:

Photo 1. The Peace River, De Soto County, near BLM tract. (Photo by Duane Winters)

Photo 2. Saltwater beach recreation on Cape San Blas tract, Gulf County. (Photo by Duane Winters)

Photo 3. Exploratory oil and gas well. (Photo anonymous)

Record of Decision

Florida Resource Management Plan

**U.S. Department of the Interior
Bureau of Land Management
Eastern States
Jackson District
Jackson, Mississippi**

This document records the decisions reached by the Bureau of Land Management (BLM) for management of the BLM-administered lands and mineral ownership within the State of Florida. The decisions, which are summarized below, are more fully described in the Resource Management Plan (RMP) that follows.

Decision

The Florida Resource Management Plan (RMP) is approved. The plan is the same as the one set forth in the proposed RMP and final environmental impact statement (EIS) released in October 1994. Major decisions of the RMP are:

- The Federal mineral ownership (FMO) underlying State-owned lands is available for exchange to the State of Florida.

To facilitate the exchange, the Withlacoochee State Forest is temporarily closed to limestone sales.

- FMO is available for oil and gas leasing as follows:

175,149 acres subject to no surface occupancy stipulations.

123,011 acres subject to seasonal restrictions and/or controlled surface use stipulations.

25,476 acres subject solely to standard management.

- FMO is available for phosphate leasing as follows:

294,947 acres subject to development constraints.

91,885 acres subject solely to standard management.

- FMO is available for limestone sales as follows:

269,340 acres temporarily closed and/or subject to development constraints.

46,219 acres subject solely to standard management.

- The Walton Beach tracts will be managed for enhancement of dune system habitat. The tracts are available for a Recreation and Public Purposes Act (R&PP) lease, or for exchange to the State of Florida to accomplish Conservation and Recreation Lands (CARL) program objectives.
- The Lathrop Bayou and Peace River tracts will be managed to protect existing habitats.
- The Sugarloaf Key tracts, if not suitable for transfer to the Key Deer National Wildlife Refuge, are available for exchange to the State of Florida for accomplishment of CARL program objectives.
- Upon revocation of the Coast Guard withdrawal, the Jupiter Inlet tract is designated an

Area of Critical Environmental Concern (ACEC) to be managed for maintenance of a viable scrub plant community.

- Upon revocation of the Coast Guard withdrawal, the Cape San Blas tract is designated an ACEC, to be managed for protection of coastal dune and strand habitats.
- Upon revocation of the Coast Guard withdrawal, the Anclote Key tract is available for transfer to the State of Florida for management of the cultural resource values associated with the lighthouse structure.

Alternatives Considered

Four alternatives, including the no action alternative and the proposed RMP, were considered in the development of the plan.

Alternative 1 was the continuation of the current management situation, or the no action alternative. It allowed mineral development subject to Standard Management including constraints developed through case-by-case evaluation. It also allowed the transfer of surface tracts from Federal ownership subject to Standard Management and case-by-case analysis.

Alternative 2 emphasized constraints on mineral development to protect other natural resource values, and management of surface tracts to provide developed areas for recreation use while protecting significant natural and cultural resource values.

Alternative 3 closed the Withlacoochee State Forest to limestone mining and emphasized constraints on mineral development to protect other natural resource values. Surface tract management emphasized protection and enhancement natural and cultural resource values, while providing low to moderate recreation use.

The **Proposed Plan** emphasized constraints on mineral development to protect other natural resource values and made the FMO underlying State-owned lands, including the Withlacoochee State Forest, available for exchange to the State of

Florida. Surface tract management emphasized protection and enhancement natural and cultural resource values, while providing low to moderate recreation use.

The Proposed Plan and Alternative 3 were the environmentally preferred alternatives.

Management Considerations

In considering the alternatives for managing FMO, BLM sought to balance national policy to provide for mineral development with mandates for protection of surface resources. In the case of oil and gas leasing and phosphate leasing, stipulations and constraints were developed whereby environmental impacts were adequately mitigated, and major conflicts with surface management were avoided. These stipulations and constraints are incorporated into the RMP. In the alternatives to allow limestone mining in the Withlacoochee State Forest, neither all significant environmental impacts nor conflicts with surface management could be avoided. Prohibition of mining, however, could be considered virtual divestiture of a valuable asset without compensation to the owners, i.e. the American people. The transfer of mineral rights to the State via a land exchange, as provided for in the RMP, offers an opportunity to resolve both aspects of the issue.

The RMP management prescriptions developed for the surface tracts promote a balance between providing recreational use and protection of sensitive resources. A most important consideration is the fact that BLM does not have a presence in the State of Florida. For this reason the RMP allows the surface tracts to be transferred to or managed by other agencies through cooperative agreement, provided that use would follow the approved management prescriptions. The most difficult issue involved recreational use conflicts on the Walton Dunes tract. The RMP follows the recommendation of the State of Florida to close the Walton Beach tracts to motorized vehicle use, in order to be consistent with the Florida Coastal Zone Management Program.

Mitigation and Monitoring

Mitigation measures, in the form of oil and gas lease stipulations, mineral development constraints and management prescriptions for surface tracts, were incorporated into the alternatives considered, including the selected plan. These measures, and additional mitigation identified during site-specific analysis, will be enforced during plan implementation. Monitoring will determine the effectiveness of these mitigation measures in minimizing environmental impacts.

Public Involvement

The BLM made a diligent effort to involve the public in the development of the Florida RMP as directed by the National Environmental Policy Act in Title 40, Part 1506.6 of the Code of Federal Regulations. The views and opinions of the public were sought through publication of formal notices, public meetings, media releases and direct mailings. The mailing list of interested parties was initiated at the outset of the process and was maintained throughout the process.

The notice of intent (NOI) to prepare the RMP/EIS was published in the *Federal Register* on September 23, 1992. The NOI invited public participation through written comments during the public scoping period, which extended through November 30, 1992 and announced three public scoping meetings. Invitation to participate was also solicited through a newspaper publication of the NOI, a media release and a direct mailing. Three public scoping meetings were held in Bartow, Tallahassee, and Santa Rosa Beach. Several agency coordination meetings were also held during the public scoping period, including a state agency coordination meeting in Tallahassee.

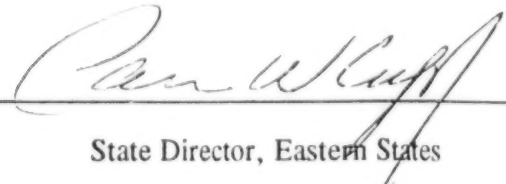
The Draft RMP/EIS was filed with the Environmental Protection Agency (EPA) during the week

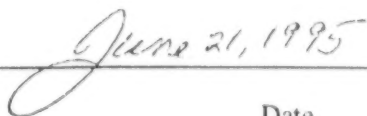
of February 7-11, 1994. During this same week, copies of the document were sent to the organizations and individuals on the mailing list, and the BLM published a notice of availability (NOA) in the *Federal Register* on February 9, 1994. The 90-day comment period was formally initiated with EPA's publication of a NOA on February 18, 1994. The release of the Draft RMP/EIS was announced through a media release, and copies of the document were sent to those on the mailing list. Public meetings to receive comments on the Draft RMP/EIS were held in Brooksville, Tallahassee, and De Funiak Springs.

A NOA of the Proposed RMP and Final EIS was published in the *Federal Register* on October 25, 1994. The 30-day protest period was initiated with EPA's publication of a NOA on October 28, 1994. The availability of the document was announced through a media release and copies were sent to those on the mailing list. The document sent to the Florida State Clearinghouse along with a request for a Governor's consistency review, and on December 12, 1994 the BLM received notification that the Proposed RMP was consistent with State policies plans and programs.

Nineteen individuals or organizations protested decisions of the proposed RMP/EIS. Three protests pertained to limestone mining in the Withlacoochee State Forest and the exchange of the mineral estate underlying the Forest to the State of Florida. Sixteen protests pertained to the closure of the Walton Beach tracts to motorized vehicle use, including boat launching. The BLM Director dismissed two protests due to lack of standing. The other seventeen protests were also dismissed, after the BLM Director concluded that the BLM State Director, Eastern States, and the Jackson District Manager followed the applicable planning procedures, laws, regulations, policies, and resource considerations in developing the Florida RMP.

Approved by:


State Director, Eastern States


Date

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Chapter 1

Introduction



Epiphytes on Peace River tract. (Photo by Faye Winters)

Chapter 1

Introduction

Purpose and Need

This document is the approved Florida Resource Management Plan (RMP). The land use decisions in this document are the same as those in the proposed RMP which was released in October 1994.

The Florida RMP provides comprehensive guidance for management of the Bureau of Land Management (BLM)-administered mineral ownership and surface tracts within the State of Florida. The RMP is the first BLM land-use plan for Florida, and fulfills the land-use planning requirements of the Federal Land Policy and Management Act of 1976 (FLPMA).

Description of the Planning Area

The land use decisions of this RMP apply to all of the BLM-administered lands and mineral ownership in the State of Florida, including the following categories:

There are 395,000 acres of **split-estate federal mineral ownership (FMO)** located in 59 of the state's 67 counties.

On split-estate FMO the federal government owns all or a portion of the mineral estate, but the surface estate is owned by either the State of Florida or private interests. The BLM is the federal agency responsible for managing split-estate FMO. Most of the split-estate FMO, approximately 300,000 acres, lies in the Blackwater River and Withlacoochee State forests. The State of Florida owns 25 percent of the mineral interests in the Blackwater River State

Forest and none in the Withlacoochee State Forest.

There are several million acres of FMO where the surface is owned and managed by other federal agencies. The BLM has certain responsibilities for managing the **mineral ownership under these federal surface managing agencies (SMAs)**. These acreages are not analyzed in detail in this document.

Land ownership of other federal SMAs is shown in Map 1, and the location of split-estate FMO is shown in Map 2.

There are 227 acres of land for which the BLM has both surface and minerals management responsibilities and an additional 143 acres, currently withdrawn to the U.S. Coast Guard (USCG), for which the BLM may assume surface management responsibility. These lands are located in seven different counties and are referred to as **surface tracts**.

Lands have been identified for which the BLM may have both surface and minerals management responsibility, but ownership is in question. These are referred to as **lands of uncertain title**.

Indian lands, i.e. the Miccosukee and Seminole reservations, are not addressed in this RMP. Planning and mineral leasing are done by individual tribes in consultation with the Bureau of Indian Affairs (BIA). BLM, however, must approve applications for permit to drill (APD) oil and gas wells.

CHAPTER 1 INTRODUCTION

Implementation and Monitoring

This RMP is intended to provide BLM with direction in land use management for 10 to 20 years following the publication of this Record of Decision. The RMP will serve as the basis for budget development. "Land use allocation" decisions, such as the required application of stipulations to new mineral leases, will be in effect upon the signing of the Record of Decision by the State Director. Other RMP decisions, such as preparation of activity plans for surface tracts, will be implemented as funds are allocated through the budgeting process. BLM will monitor the RMP on an annual basis to track successful completion of the actions approved by the RMP and to identify needed changes to the RMP.

Maintenance and Modification

This plan will be updated as necessary to keep current without changing its scope or intent. Minor changes in data, which do not necessitate changes in land use decisions, will be documented in support records. These type of plan changes are referred to as plan maintenance, and do not require public involvement.

BLM will involve the public in any substantive modification of the land use decisions of this

RMP. Any change to land use allocations, restrictions, or uses will be effected through a formal plan amendment prepared in conformance with BLM planning regulations found in Section 1610.4 Title 43 of the Code of Federal Regulations. Monitoring and evaluation findings, new data, and new or revised policies will be evaluated to determine whether an amendment is needed. In all cases, a proposed action that does not conform to the RMP but warrants consideration, will require a plan amendment. The amendment process is similar to the resource management planning process, but the scope of information, analysis and documentation is more limited. An amendment is often site specific and involves only one issue.

Document Format

This chapter (Chapter 1) contains introductory material and information on use of the RMP. Chapter 2 presents the land use decisions. The document concludes with several appendices, a glossary, and references cited. The appendices contain more detailed information to supplement the main text. The appendices are as follows: Appendix A, Areas of Critical Environmental Concern (ACEC); Appendix B, Lands; Appendix C, Oil and Gas; Appendix D, Recreation and Visual Resources; Appendix E, Soils; Appendix F, Solid Minerals; and Appendix G, Wildlife and Vegetation.

Chapter 2

Land Use Decisions



Remnant of original dunes on Dune Allen I tract. (Photo by Robert V. Abbey)

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Chapter 2

Land Use Decisions

Standard Management

The following Standard Management is a combination of existing policies and management practices that will be followed by the BLM in the management of Federal mineral ownership (FMO) and surface tracts of public land.

1. Public lands, which are identified or returned to BLM management after the approval of this plan, will be managed according to the criteria presented in Appendix B.
2. Disposal of surface tracts with existing land-use authorizations will be subject to valid existing rights.
3. Specific surface tracts identified for disposal will be evaluated for the presence of significant resource values prior to disposal. Resources to be evaluated will include minerals, recreation, cultural, wetlands, and threatened, endangered, and other special status species.
4. The disposal criteria set forth in Sec. 203 (a) (1) of the Federal Land Policy and Management Act (FLPMA) apply to all surface tracts identified as available for sale.
5. Color-of-Title cases will be processed on a case-by-case basis.
6. The disposal (i.e., 209 conveyance or exchange) of reserved mineral interests will be processed on a case-by-case basis.
7. Disposal of habitat of federally listed endangered or threatened species would occur only after consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act of 1973, as amended, or, in the case of state-listed species, only after a conference with the Florida Game and Freshwater Fish Commission (FGFWFC).
8. BLM will avoid jeopardizing the continued existence of any federally listed or state-listed or proposed species, will actively promote species recovery, and will work to improve the status of candidate and sensitive species.
9. Opportunities for land acquisition will be considered, if the acquisition would help meet one or more of the resource management objectives of this plan, or meet one or more of the acquisition criteria listed in Appendix B.
10. All land-use proposals will be evaluated for conformance with plan objectives and land-use allocations. Case-by-case processing will include evaluation of resource values in the National Environmental Policy Act (NEPA) compliance process.
11. Resolution of unauthorized use will be pursued on a case-by-case basis. Resolution will include termination of use and payment of damages, including reclamation of disturbed land, if needed. In some cases, use may be authorized through rights-of-way, permits, leases, or through land disposal.
12. BLM will give priority to the designation and protection of Areas of Critical Environmental Concern (ACECs) through cooperation with other agencies and groups (see Appendix A).
13. Agreements will be pursued with state or local government fire protection agencies for suppression of wildfire on all surface tracts.
14. Management actions will be conducted in a manner which conform to the objectives of

CHAPTER 2

LAND USE DECISIONS

the State Air Quality Implementation Plan (SIP) of the Florida Department of Environmental Protection (FLDEP).

15. Management actions will be conducted in a manner conforming to the water quality management objectives which have been developed by the FLDEP as required by the 1987 Water Quality Act Amendments to the Federal Water Pollution Control Act.
16. Measures for minimizing accelerated soil erosion will continue to be made on a site-specific basis through evaluation of management actions. Prior to authorization of surface disturbance, a determination will be made regarding prime and unique farmland identified by the U.S. Soil Conservation Service (SCS).
17. All management actions will comply with the National Historic Preservation Act (NHPA) of 1966, as amended through 1992 (16 U.S.C. 470), which provides protection for significant cultural resources. An appropriate level of inventory will be conducted for all actions with a potential to affect these resources. Actions may require consultation with the State Historic Preservation Officer (SHPO) and/or the Advisory Council on Historic Preservation (36 CFR 800).
18. No Native American religious sites, ceremonial sites or treaty rights areas were identified. Additional consultation with the three federally recognized tribes in Florida will take place on a case-by-case basis, in accordance with BLM Manual 8160 and General Procedural Guidance for Native American Consultation, currently in draft form.
19. Utility corridors are not identified because of the small amount of BLM surface land ownership within the planning area. Right-of-way avoidance areas are identified to provide for protection of sensitive resources.
20. All tracts identified as available for disposal through sale or exchange are right-of-way avoidance areas, if the granting of a right-of-way would adversely affect tract marketability.
21. Review of existing withdrawals will determine if they are fulfilling their intended purpose or are not needed. Existing withdrawals are listed in Appendix B.
22. Unless specifically prohibited by law, regulation, withdrawal, or land-use allocations of a particular alternative, all BLM-administered mineral ownership is available for exploration and development. BLM-administered mineral ownership under other federal SMAs is available for exploration and development subject to SMA consent and to conditions developed by SMAs through their land-use planning and NEPA compliance processes. More detailed discussions of Standard Management for Oil and Gas and Solid Mineral resources are presented in Appendices C and F, respectively.
23. The harvesting of any sensitive species is prohibited, except when explicitly authorized for scientific purposes by the appropriate state and/or federal agency.
24. Vegetative manipulation, including prescribed burning, is allowed if needed to meet resource condition objectives.
25. Unless otherwise stated, vehicle use is limited to existing routes of travel until route designation decisions are completed through activity plans or amendments to this plan.
26. Livestock grazing will not be allowed within the ACECs or Special Recreation Management Areas (SRMAs), on tracts identified for transfer to other agencies, or on tracts identified as suitable for disposal through sale or exchange.
27. Recreation Opportunity Spectrum (ROS) classification objectives (Appendix D) will be used in evaluating recreational opportunities.

On tracts which are not avoidance areas, right-of-way proposals will be open to normal case-by-case evaluation.

CHAPTER 2 LAND USE DECISIONS

on the surface tracts. Recreation development will conform to requirements of The Architectural Barriers Act of 1968 (Public Law 90-480); The Rehabilitation Act of 1973 (Public Law 93-112), as amended in 1978; and The Americans with Disabilities Act (Public Law 101-336) of 1990.

Case-by-case processing of land-use and mineral development proposals will include consideration of impacts to recreational resources.

28. Visual Resource Management (VRM) objectives will not apply to tracts identified as suitable for disposal through sale.

Case-by-case processing of land-use and mineral development proposals will include consideration of impacts to visual resources.

29. Proposed uses will be evaluated for their potential to release hazardous materials into the environment. Use of hazardous materials must comply with the Resource Conservation and Recovery Act (RCRA).

Disposal of hazardous materials on surface tracts is prohibited. The discovery of unpermitted hazardous materials will be handled in accordance with the reporting, removal, and remediation requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Mineral Ownership Decisions

The FMO decisions identify constraints that would be placed on the availability of FMO for mineral development. FMO acreage is identified as either closed to mineral development, available subject to lease stipulations or other constraints or available subject to the requirements of Standard Management. The acreage figures presented are of split-estate FMO. BLM-administered mineral ownership under other federal SMAs is available for exploration and development subject to SMA consent and to stipulations developed by SMAs through the land-use planning and NEPA compli-

ance processes. If the resources protected by the stipulations/constraints of this plan are present on SMA lands, then either the stipulations/constraints of this plan or similar SMA stipulations/constraints would apply.

Oil and Gas

Stipulations to protect sensitive resources including No Surface Occupancy (NSO) stipulations, will apply to new oil and gas leases. The stipulations and a required lease notice are presented in Appendix C and illustrated in Map 6 and Map 7. Table 2-1 summarizes the availability of FMO for oil and gas leasing. The acreage affected by each stipulation is shown in Table 2-2. If the resources protected by the stipulations are found on SMA lands, the same stipulation(s) or similar stipulation(s) developed by the SMA will be applied. Within the bounds of the prescribed stipulations, management of leasing, exploration, and development will be according to Standard Management, as outlined earlier in this chapter, and in Appendix C. Additional stipulations may be developed during evaluation of individual lease proposals through the NEPA compliance process. All leases within the Blackwater River State Forest will be subject to the Florida Division of Forestry (FLDF) stipulations as listed in Appendix C or updated by FLDF.

Table 2-1. Availability of FMO for Oil and Gas Leasing.

Category	High Oil/Gas Potential	Moderate Oil/Gas Potential	Low Oil/Gas Potential	Total
	(acres)	(acres)	(acres)	(acres)
Closed	0	0	0	0
Subject to NSO or Other Constraints	76,900	6,400	91,849	175,149
Subject to Other Constraints	106,994	4,282	11,735	123,011
Subject Solely to Standard Management	0	812	24,664	25,476
Total	183,894	11,494	128,248	323,636

CHAPTER 2

LAND USE DECISIONS

Table 2-2. Oil and Gas Stipulations.

Stipulations	High Potential Acres	Moderate Potential Acres	Low Potential Acres	Total Acres Affected
No Surface Occupancy (NSO)				
Bald eagle	7	0	372	379
Choctawhatchee beach mouse	0	97	0	97
Coastal strand	35	15	20	70
Florida scrub habitats	0	977	1,196	2,173
Longleaf Pine Preservation Area (Blackwater River State Forest)	580	0	0	580
Red-cockaded woodpecker	750	0	790	1,540
Sandhills	538	199	41,560	42,297
Soil and water	27,503	NA	NA	27,503
Tropical hardwood hammock	65	70	0	135
Wading bird rookeries	0	11	33	44
Wetlands/Aquatic Habitat	68,527	5,057	48,701	122,285
Wood stork	0	0	162	162
¹ Net Total NSO	76,900	6,400	91,849	175,149
Seasonal Restriction				
Bald eagle	207	341	6,101	6,649
Wading bird rookeries	0	51	119	170
Wood stork	6	0	288	294
¹ Net Total Seasonal Restriction	47	102	3,787	3,936
Controlled Surface Use (CSU)				
Florida panther	726	642	0	1,368
Gopher Tortoise	130,694	5,371	83,639	199,401
Groundwater CSU 1 (Closed mud systems)	35,318	NA	NA	35,318
Groundwater CSU 2 (Closed mud systems or lined reserve pit)	116,288	NA	NA	116,288
Groundwater CSU 3 (Lined reserve pit)	4,993	NA	NA	4,993
Red-cockaded woodpecker	36,909	0	38,877	75,786
¹ Net Total CSU	92,661	4,180	7,948	104,789

¹Net totals are less than sum totals because stipulation areas overlap. **Net Total NSO** resolves overlaps among NSO stipulations. **Net Total Seasonal Restriction** resolves overlaps among Seasonal Restriction stipulations and subtracts the area affected by NSO stipulations. **Net Total CSU** resolves overlaps among CSU stipulations and subtracts the area affected by Seasonal Restriction and NSO stipulations.

CHAPTER 2 LAND USE DECISIONS

Phosphate

Constraints to protect sensitive resources will apply to new leases and mining operations. The constraints are presented in Appendix F and illustrated in Map 8. The availability of FMO for phosphate leasing is summarized in Table 2-3. The acreage affected by each constraint is shown in Table 2-4. Within the bounds of the prescribed constraints, management of leasing, exploration and mining operations will be according to Standard Management as outlined earlier in this chapter and in Appendix F. Additional constraints may be developed during evaluation of individual lease proposals through the NEPA compliance process.

Table 2-3. Availability of FMO for Phosphate Leasing.

Category	High Phosphate Potential	Moderate Phosphate Potential	Low Phosphate Potential	Undetermined Potential	Total
	(acres)	(acres)	(acres)	(acres)	(acres)
Closed	0	0	0	0	0
Subject to Constraints	190	2,731	39,423	252,595	294,947
Subject Solely to Standard Management	1,693	6,224	21,070	62,898	91,885
Total	1,883	8,955	60,493	315,493	386,832

Table 2-4. Phosphate Mining Constraints.

Constraints	High Potential Acres	Moderate Potential Acres	Low Potential Acres	Undetermined Potential Acres	Total Acres Affected
Bald eagle nests	0	556	4,024	6,548	11,128
Choctawhatchee beach mouse	0	0	0	97	97
Coastal strand	0	0	0	70	70
Florida scrub habitats	0	698	2,755	1,574	5,027
Gopher Tortoise	55	1,609	25,930	215,967	243,506
Red-cockaded woodpecker	0	0	0	77,326	77,326
Sandhills	0	30	4,554	41,595	46,179
Tropical hardwood hammock	0	0	0	174	174
Wading bird rookeries	0	0	97	241	338
Wetlands/Aquatic Habitat	143	566	9,469	119,423	129,661
Wood Stork	0	0	0	616	616
Net Total Affected by Constraints	198	2,731	39,423	252,595	294,947

CHAPTER 2

LAND USE DECISIONS

Limestone

To allow for the exchange of FMO to the State of Florida, the Withlacoochee State Forest will be temporarily closed to limestone sales. The closure will be in effect for up to three years to allow for the adoption of an exchange agreement, or until the State of Florida declines the offer to exchange. If an exchange agreement is adopted the closure will continue for the term of the agreement.

Constraints to protect sensitive resources will apply to new sales and mining operations. The constraints are presented in Appendix F and illustrated in Map 8. Table 2-5 summarizes the availability of FMO for limestone sales. The acreage affected by each constraint is shown in Table 2-6. Within the bounds of the prescribed constraints, management of sales, exploration, and mining operations would be according to Standard

Management as outlined earlier in this chapter and in Appendix F. Additional constraints would be developed during evaluation of individual proposals through the NEPA compliance process.

Table 2-5. Availability of FMO for Limestone Sales.

Category	High Limestone Potential	Moderate Limestone Potential	Low Limestone Potential	Undetermined Potential	Total
	(acres)	(acres)	(acres)	(acres)	(acres)
Closed	0	0	0	0	0
Temporarily Closed and/or Subject to Constraints	33,948	50,076	9,339	175,977	269,340
Subject to Solely to Standard Management	15	25	1,821	44,358	46,219
Total	33,963	50,101	11,160	220,335	315,559

Table 2-6. Limestone Mining Constraints.

Constraints	High Potential Acres	Moderate Potential Acres	Low Potential Acres	Undetermined Potential Acres	Total Acres Affected
² Temporary Closure	33,887	49,393	7,100	27,658	118,038
Bald eagle nests	3,515	1,678	178	1,176	6,547
Choctawhatchee beach mouse	0	0	0	97	97
Coastal strand	0	0	0	70	70
Florida scrub habitats	543	5	0	1,026	1,574
Gopher Tortoise	23,712	30,568	8,281	153,420	215,981
Red-cockaded woodpecker	7,783	5,272	12,302	51,969	77,326
Sandhills	12,840	9,412	5,003	14,340	41,595
Tropical hardwood hammock	0	0	0	174	174
Wading bird rookeries	0	119	0	122	241
Wetlands/Aquatic Habitat	12,636	25,974	2,792	78,081	119,483
Wood Stork	0	162	0	450	612
¹ Net Total Affected by Constraints	33,948	50,076	9,339	175,977	269,340

¹Net totals are less than sum totals because constraint areas overlap. Net totals resolve the overlap.

²Acreage within the Withlacoochee State Forest would be temporarily closed to allow for exchange of FMO to the State of Florida.

Surface Tract Decisions

The decisions for Surface Tracts are presented in the following portion of this chapter. These decisions consist of two elements:

Management Objectives. These outline the resource conditions to be maintained or enhanced.

Land-Use Allocations. These are the decisions of where land uses will be allowed, restricted, or excluded.

In addition, **Management Actions** are listed for each tract. These are anticipated implementation actions which help to ensure that management objectives are met and that land-use allocations are followed. They also provide a basis for future BLM budgeting and programming. Not all

management actions can be anticipated at this time. Some of the management actions listed may prove to be unnecessary.

There are seven tracts/tract groups in all. The first four, Walton Beach, Lathrop Bayou, Peace River, and Sugarloaf Key are BLM-administered surface tracts; the size and location of each are listed in Appendix Table B-1. The last three, Jupiter Inlet, Cape San Blas, and Anclote Key, are currently under withdrawal to the USCG; the size and location of each are listed in Appendix Table B-3. The decisions for these tracts will be implemented if and when withdrawals are revoked and the tracts are returned to BLM management based upon a suitability report pursuant to 43 CFR 2372.

A page with decisions for each tract is accompanied by maps depicting tract locations. These maps are presented in Figures 2-1 through 2-7.

CHAPTER 2

LAND USE DECISIONS

Land Use Decisions for the Walton Beach Tracts

Management Objectives

Manage for the protection and enhancement of the dune system and associated habitat, providing opportunities for non-motorized recreation activities and interpretation of significant natural resources in a Residential Beach Community setting.

Land-Use Allocations

The tracts will not be available for disposal through sale or exchange, except to the State of Florida to accomplish CARL program objectives.

The tracts will be available for cooperative management with other government agencies and/or private organizations.

The tracts will be available for Recreation and Public Purposes Act (R&PP) conveyance, provided the proposed use will follow the stated management objectives and land-use allocations.

Management actions will conform to ROS Residential Beach Community objectives.

The tracts will be closed to motorized vehicle use.

Management actions will conform to Class III VRM objectives.

The tracts will be classified as an avoidance area for rights-of-way.

The tract will be closed to solid mineral development, and oil and gas leasing will be subject to NSO stipulations for protection of Coastal Strand habitat and Soil and Water (see Appendix C).

Management Actions

Pursue cooperative management opportunities.

Complete and implement an activity plan. Implementation may include the following actions.

- Install motorized vehicle closure and dune system interpretive signs.
- Construct boardwalks for recreation users.
- Install drift fence and/or undertake other measures to improve coastal dune ecosystem habitat.

Issue and implement motorized vehicle closure.

Implement a sea turtle nest protection program.

Monitor the coastal dune ecosystem and recreation use to ensure natural resource values are protected.

CHAPTER 2

LAND USE DECISIONS

Land Use Decisions for the Lathrop Bayou Tract

Management Objectives

Manage to obtain a mature stand of slash pine and protect existing use of the tract by federally listed and candidate species, while allowing recreation use in a Primitive setting.

Land-Use Allocations

The Lathrop Bayou tract will be administered as a wildlife habitat management area.

The tract will be available for cooperative management with other government agencies and/or private organizations.

The tract will be retained in public ownership and will not be available for disposal through R&PP conveyance, sale, or exchange.

Management actions will conform to ROS Primitive objectives.

The tract will be closed to motorized vehicle use.

The tract will be seasonally closed to public entry from October 1 through May 30 to protect sensitive wildlife habitat.

Management actions will conform to Class II VRM objectives.

The tract will be classified as an avoidance area for rights-of-way.

The tract will be closed to mineral leasing and sales to protect sensitive wildlife habitat.

Management Actions

Pursue cooperative management opportunities.

Complete and implement a Habitat Management Plan. Implementation may include the following actions.

- Vegetative treatment to obtain a mature stand of slash pine and maintain fire species and reduce fire hazard.
- Develop cooperative agreement to monitor seasonal closure.
- Install interpretive signs to protect sensitive habitat.

Issue and implement the motorized vehicle closure and seasonal closure to public entry.

Monitor habitat and recreation use to ensure natural and cultural resource values are protected.

CHAPTER 2
LAND USE DECISIONS

Land Use Decisions for the Peace River Tract

Management Objectives

Manage to maintain existing hydric hammock and cypress swamp habitat, while allowing recreation use in a Primitive setting.

Land-Use Allocations

The Peace River tract will be administered as a wildlife habitat management area.

The tract will be available for cooperative management with other government agencies and/or private organizations.

The tract will be retained in public ownership and will not be available for disposal through R&PP conveyance, sale, or exchange.

Management actions will conform to ROS Primitive objectives.

The tract will be closed to motorized vehicle use.

Management actions will conform to Class II VRM objectives.

The tract will be classified as an avoidance area for rights-of-way.

Mineral development will be subject to stipulations and constraints for protection of wetlands/aquatic habitat.

Management Actions

Issue and implement the motorized vehicle closure.

Monitor habitat and recreation use to ensure protection of natural resource values.

Consider opportunities for cooperative management.

CHAPTER 2
LAND USE DECISIONS

Land Use Decisions for the Sugarloaf Key Tracts

Management Objectives

Increase management efficiency through transfer or disposal of the tracts.

Management Actions

Pursue withdrawal to the Key Deer National Wildlife Refuge.

Land-Use Allocations

The tracts will be considered potentially suitable for management as part of the Key Deer National Wildlife Refuge. If upon further review, the tracts are found unsuitable for this purpose they will be available for disposal through sale, exchange, or R&PP conveyance. Priority for disposal will be to the State of Florida to accomplish CARL program objectives.

CHAPTER 2

LAND USE DECISIONS

Land Use Decisions for the Jupiter Inlet Tract

Management Objectives

Manage wildlife habitat to maintain a viable scrub community and improve habitat conditions for Florida scrub jay, gopher tortoise, and other endemic scrub species, while interpreting natural and cultural resources and providing recreation opportunities in an Urban setting.

Land-Use Allocations

Lot 15 of the tract will be designated as the Jupiter Inlet ACEC (Appendix A).

The tract will be available for cooperative management with other government agencies and/or private organizations.

Lot 13 will be available for R&PP conveyance, subject to protection of existing cultural and natural resource values. Lot 15 will be available for R&PP conveyance, provided the proposed use follows the stated management objectives and land-use allocations, and the management prescriptions developed for the ACEC. The tract will not be available for disposal through sale or exchange.

Management actions will conform to ROS Urban objectives.

Motorized vehicle use will be limited to designated routes. Vehicle routes will be designated open or closed by the activity plan prepared for the ACEC or by a R&PP development plan.

Management actions will conform to Class III VRM objectives.

The tract will be classified as an avoidance area for rights-of-way.

The ACEC will be withdrawn from entry under the 1872 mining law, closed to mineral material sales, and lease of solid minerals. The tract will not be available for oil and gas leasing due to existing regulation prohibiting the lease of lands within incorporated city limits.

Management Actions

Prepare an activity plan for the ACEC.

Rejuvenate the mature stand of sand pine scrub and restore scrub communities in disturbed areas, using prescribed fire and/or mechanical methods.

Remove exotic vegetation.

Issue and implement motorized vehicle route designations.

Monitor habitat and recreation use to ensure protection of cultural and natural resource values.

Develop interpretive facilities.

Implement withdrawal from mineral entry and leasing.

TOWNSHIP 40 SOUTH, RANGE 43 EAST, OF THE TALLAHASSEE MERIDIAN, FLORIDA
DEPENDENT RESURVEY AND SURVEY OF LOTS 12, 13 AND 14 IN SECTION 31

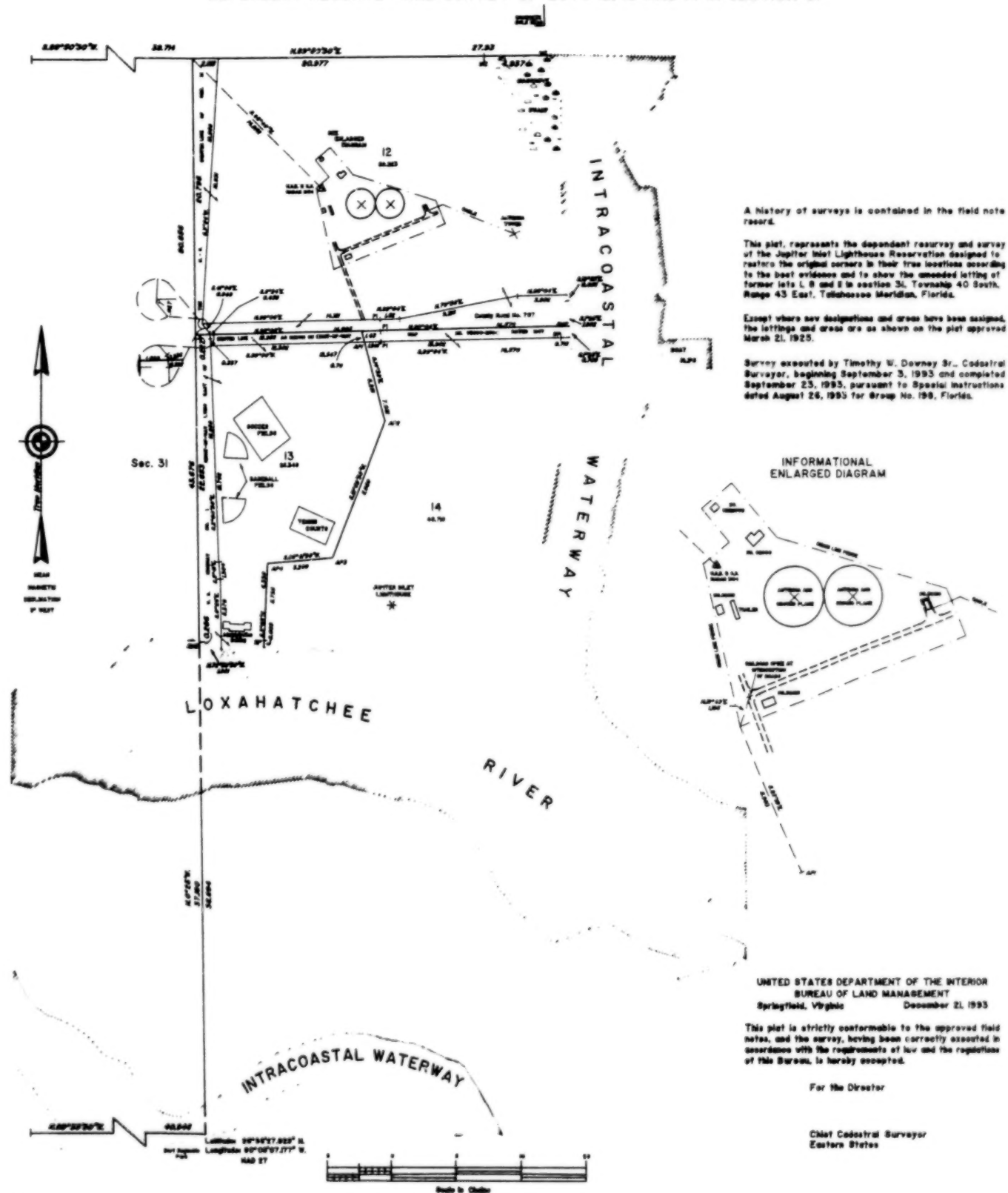
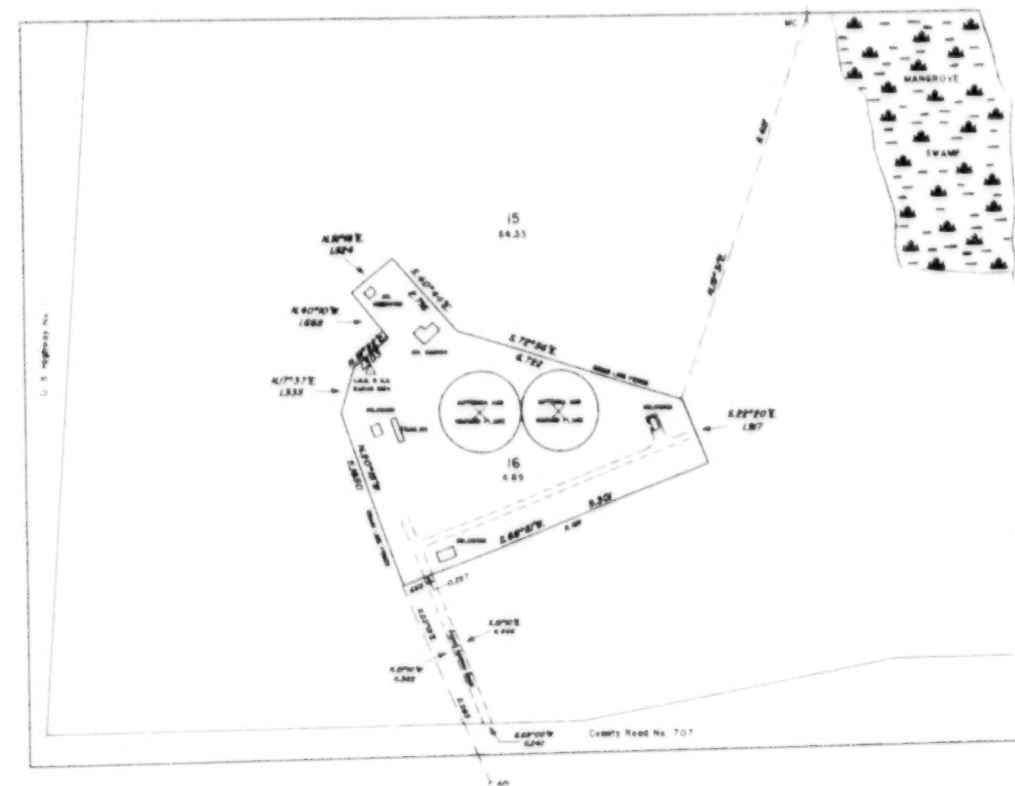


Figure 2-5b. Survey plat of the lot divisions of the Jupiter Inlet tract. (Note that lot 12 has been amended as shown in Figure 2-5c.)

TOWNSHIP 40 SOUTH, RANGE 43 EAST, OF THE TALLAHASSEE MERIDIAN, FLORIDA
SUPPLEMENTAL PLAT OF SECTION 31

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Sec. 31



This supplemental plat of section 31, Township 40 South, Range 43 East, Tallahassee Meridian, Florida, portrays the amended lottings of Lot 12 which was so designated on the plat accepted February 24, 1994. The segregation of Lot 15 (84.33 acres) and Lot 16 (4.89 acres) from original Lot 12 are based upon the location of a chain link fence as traversed in the field notes of the dependent resurvey approved February 24, 1994.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Springfield, Virginia June 2, 1995

This plat, showing new lottings, is based upon the official records, and having been correctly prepared in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Chief Cadastral Surveyor
Eastern States

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CHAPTER 2

LAND USE DECISIONS

Land Use Decisions for the Cape San Blas Tract

Management Objectives

Protect the coastal dune and strand habitats utilized by nesting sea turtles and shore birds, while allowing Semi-Primitive Non-Motorized recreation use and protecting significant resource values.

Land-Use Allocations

This tract will be designated as the Cape San Blas ACEC (Appendix A).

The tract will be available for cooperative management with other government agencies and/or private organizations.

The tracts will be available for R&PP conveyance, provided that the proposed use will follow the objectives and management prescriptions of this alternative, but will not be available for disposal through sale or exchange.

Management actions will conform to ROS Semi-Primitive Non-Motorized objectives.

The tracts will be closed to motorized vehicle use and parking will not be provided.

Management actions will conform to Class II VRM objectives.

The ACEC will be classified as an avoidance area for rights-of-way.

The ACEC will be withdrawn from entry under the 1872 mining law, closed to mineral material sales and lease of solid minerals. Oil and gas leasing will be subject to the NSO stipulation for protection of Coastal Strand habitat (See Appendix C).

Management Actions

Prepare an activity plan for the ACEC.

Issue and implement motorized vehicle closure.

Monitor habitat and recreation use to ensure natural resource values are protected.

Implement withdrawal from mineral entry and leasing.

Implement sea turtle nest protection program.

CHAPTER 2

LAND USE DECISIONS

Land Use Decisions for the Anclothe Key Tract.

Management Objectives

Increase management efficiency through transfer or disposal of the tracts, while preserving the historical value of the lighthouse structure.

Land-Use Allocations

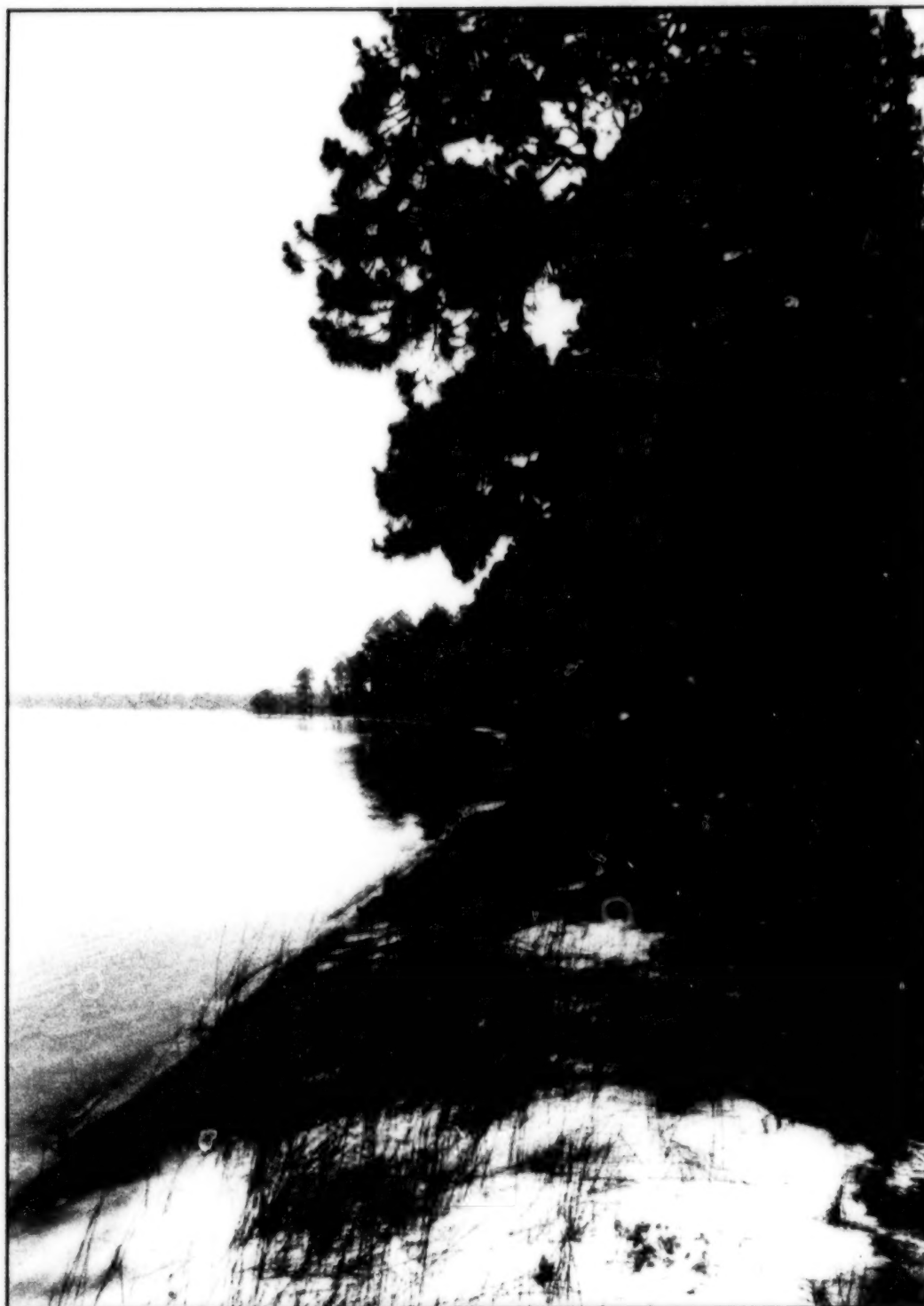
The tract will be available for disposal through sale, exchange or R&PP conveyance. Priority will be given to acquisition by the State of Florida for inclusion in the surrounding Anclothe Key State Preserve. If it is not possible for the State to manage the lighthouse on site, the feasibility of moving the lighthouse and restoring it at a different site will be explored prior to disposal of the tract. If preservation is not feasible, the historical value of the lighthouse will be recorded prior to dismantling it.

Management Actions

Develop proposal to transfer the surface and lighthouse to the State of Florida.

If lighthouse must be moved, coordinate closely with SHPO, Advisory Council for Historic Preservation, and local historical societies to select a site and minimize the loss of integrity to the structure.

Appendices



Beach and pine flatwoods on Lathrop Bayou tract. (Photo by Judith Pace)

Appendix A

Areas of Critical Environmental Concern

Introduction

Areas of Critical Environmental Concern (ACECs) were authorized in Section 202 (c)(3) of the Federal Land Policy and Management Act of 1976 (FLPMA, P.L. 94-579). ACECs are areas where special management attention is needed to protect, and prevent irreparable damage to important historic, cultural, and scenic values, fish or wildlife resources, or other natural systems or processes; or to protect human life and safety from natural hazards.

To be designated an ACEC, an area must meet both the criteria of importance and relevance. A relevant resource is a significant value or resource of a type described above. An important resource is a value, system, process, or hazard which has substantial significance and values.

To be designated as an ACEC, an area must require special management attention to protect the important and relevant values. These are management measures which would not be necessary and prescribed if the critical and important features were not present. That is, they would not be prescribed in the absence of the designation. For each ACEC designated by this plan, management prescriptions have been developed, and are included in Chapter 2 as Land Use Allocations for surface tracts.

Areas Designated as ACECs

Jupiter Inlet

This tract is a unique and extraordinary remnant of natural biological diversity, surrounded by urban development. The tract supports approximately 45 acres of mature sand pine scrub

and xeric oak scrub. In Palm Beach County, where scrub communities have been reduced by 95 percent (Fernald 1989), this is one of the few remaining publicly-owned tracts of scrub habitat. It is an important link with remaining scrub areas, such as Jonathan Dickinson State Park to the north in Martin County. A band of black mangrove borders the Intracoastal Waterway on the eastern edge of the tract. Surveys completed in 1993 identified four special status wildlife species, including a breeding population of Florida scrub jay, Florida mouse, gopher tortoise, and scrub lizard. The portion of the Intracoastal Waterway adjacent to the tract is within designated manatee critical habitat. In addition, 10 special status plant species have been identified on the tract, including federally endangered beach jacquemontia and a single specimen of four-petal pawpaw. Parcels A and B of this tract are designated an ACEC.

Cape San Blas

This beachfront tract is predominately slash pine/palmetto in upland areas with a relatively well-developed coastal dune system. The low dunes are vegetated with typical sea grape, sea oats, and scattered palmetto. Loggerhead turtles nested on this tract in 1992. Atlantic green sea turtles have nested at nearby Eglin Air Force Base, and may utilize this tract. The tract provides suitable habitat for the southeastern snowy plover, a frequent breeder at the tip of the Cape San Blas. It is also likely that wintering piping plover use the tract. Vehicular and pedestrian use of the beaches in this area may be inhibiting use of the tract by these shorebirds. Peregrine falcon are known to winter in this area, and are a frequent fall and spring migrant. Bald eagles have been observed in the area, and nest on nearby St. Vincent Island. This tract is designated an ACEC to protect the coastal dune habitat.

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Appendix B

Lands

Introduction

The BLM is responsible for managing the remnants of the nation's once vast land holdings—the public domain. Of the 1.8 billion acres of original public domain land acquired by the United States, two-thirds went to individuals, industries, and states. Of that remaining, much was withdrawn from the public domain to be set aside for national forests, wildlife refuges, national parks, military bases, and other public purposes, leaving BLM to manage about 272 million acres — one-eighth of the nation. Most of these lands are located in 11 western states including Alaska.

Virtually all of the public domain surface land remaining in the eastern states, including Florida, are small tracts that are 1) lands that were not distributed to states upon granting statehood, 2) small isolated tracts that were simply overlooked, 3) mistakes in legal entry made in ownership records at the time claims such as military warrants were exercised, or 4) errors or oversights due to the metes-and-bounds survey system that was used to describe tracts. The BLM Office of Eastern States does occasionally discover lands that are legally BLM-administered public domain lands due to the above factors. In addition, land may be discovered through new cadastral survey, or review of land records. Lands may also return to BLM management because private title claims on color-of-title lands prove insupportable, R&PP patented lands revert to BLM management, and because withdrawals of public land to other federal agencies are revoked.

Known BLM-administered surface tracts are listed in Table B-1.

Lands of uncertain title are presented in Table B-2. Withdrawn lands are listed in Table B-3, and R&PP patented lands are in Table B-4.

The primary responsibility of BLM in Eastern States is minerals management, including split-estate FMO where mineral rights were reserved by the federal government prior to disposal of the surface. The acreage of split-estate FMO by county is presented in Table B-5, and FMO under state-owned lands is listed in Table B-6.

Management Criteria for Unidentified Lands

Criteria will be used to assess the manageability and resource values of surface tracts that are identified or are returned to BLM in the future, and to establish a categorization of tracts for retention or disposal. In addition, criteria will be used for determining future land acquisition to support the mission of the Department of the Interior.

Management Objectives

Land management decisions will be made after thorough analysis and study of land-use potential, and should achieve the following long-term objectives.

1. To retain and acquire lands for management of significant public resource values.
2. To adjust the BLM land pattern to get the highest public resource value.
3. To identify and transfer those public lands with values which could be better managed by

another public agency, or used in the private sector.

Retention Criteria

Manageable lands containing the following values will be retained where values can best be managed in public ownership by BLM.

1. Wetlands and riparian areas determined to come under the definition of Executive Order 11990.
2. Areas of national economic significance, such as designated mineral resource areas, where the disposal of the surface would interfere with the logical development of the federal mineral estate.
3. Areas where management is cost effective, or lands contain other important characteristics, including, but not limited to:
 - a. Areas, rivers, or trails designated, or eligible, for congressional, state, or local designation.
 - b. Tracts with threatened or endangered species habitat.
 - c. Sites potentially eligible or currently listed on the NRHP.
4. Lands with a combination of broad multiple-use values.
5. Areas where future plans will lead to further consolidation and improvement of land patterns, and reduce the cost of management.

6. Public lands which provide public access and contain previously mentioned public resource values which, when considered together, warrant their retention.

7. Lands with significant resource values.

Disposal Criteria

Disposal decisions will be made in the public interest based upon the following criteria:

1. Lands with high public resource values proper for management by other federal agencies, or state, local government or resource managing organizations.
2. Lands of limited public resource value.
3. Lands with long-term unauthorized use problems, and which are not required for specific public purposes.
4. Lands in which the highest value, or most appropriate long-term use, is agriculture, or commercial, industrial, or residential development.
5. Lands which can be best used to exchange for other lands that have a higher public resource value relative to obtaining region-wide ecosystem management goals.

Acquisition Criteria

1. Lands which meet retention criteria.
2. Lands needed to help obtain region-wide ecosystem management goals.

Table B-1. BLM-Administered Surface Tracts

Tract No. (Name)	County	Legal Description	Acres
BLM-0911102-PD (Lathrop Bayou)	Bay	T. 5 S., R. 12 W. Sec. 15, Lot 1; Sec. 22, Lots 5 - 12; Sec. 27, Lots 8 & 9.	5.39 177.35 2.29
BLM-0911102-PD (Peace River)	DeSoto	T. 39 S., R. 23 1/2 E. Sec. 1, Frl.	35.58
BLM-0911102-PD (Sugar Loaf Key)	Monroe	T. 67 S., R. 27 E. Sec. 14, Lot 14; Sec. 14, Lot 38.	2.50 1.07
BLM-0911102-PD (Walton Dunes)	Walton	T. 3 S., R. 18 W. Sec. 19, Lot 34.	1.28
(Dune Allen II)		T. 3 S., R. 20 W. Sec. 3, Lot 37;	.58
(Dune Allen I)		Sec. 4, Lot 37.	1.65
Total			227.69

Table B-2. Land of Uncertain Title¹

Tract No.	County	Legal Description	² Acres
BLM-0911102-PD	Bay	T. 3 S., R. 16 W. Sec. 34, Tract 5.	3.00
BLM-0911102-PD	Brevard	T. 22 S., R. 37 E. Sec. 19, Lot 3.	1.52
BLM-0911102-PD	Brevard	T. 22 S., R. 37 E. Sec. 19, Lot 89.	2.20
BLM-0911102-PD	Brevard	T. 22 S., R. 37 E. Sec. 30, Lot 4.	1.56
BLM-0911102-LB	Brevard	T. 22 S., R. 37 E. Sec. 30, Lot 49.	1.56
BLM-0911102-LB	Brevard	T. 23 S., R. 38 E. Sec. 28, W2NE.	Unknown
BLM-0911102-PD	Brevard	T. 23 S., R. 38 E. Sec. 28, NW.	Unknown
BLM-0911102-PD	Brevard	T. 23 S., R. 38 E. Sec. 29, N2.	Unknown
BLM-0911102-PD	Brevard	T. 23 S., R. 38 E. Sec. 29, Lot 3.	Unknown
BLM-0911102-PD	Citrus	T. 18 S., R. 20 E. Sec. 34, Lot 1, Island.	0.02
BLM-0911102-PD	Citrus	T. 18 S., R. 19 E. Sec. 11, Tract 37 Island.	0.25
BLM-0911102-PD	Citrus	T. 19 S., R. 20 E. Sec. 4, Lot 9, Island.	12.87
BLM-0911102-PD	Citrus	T. 19 S., R. 16 E. Sec. 11, Lot 11.	3.40
BLM-0911102-PD	Citrus	T. 18 S., R. 20 E. Sec. 33, Lot 9, Island.	0.04
BLM-0911102-PD	Columbia	T. 2 S., R. 16 E. Sec. 11, All.	Unknown
BLM-0911102-PD	Hamilton	T. 1 N., R. 13 E. Sec. 15, SWNE.	Unknown

Table B-2. Concluded.

Tract No.	County	Legal Description	² Acres
None	Lee	T. 44 S., R. 22 E. Tract No. 37. T. 44 S., R. 22 E. Tract No. 37.	Unknown
BLM-0911102-PD	Levy	T. 14 S., R. 12 E. Sec. 24, All.	Unknown
None	Marion	T. 14 S., R. 19½ E. Sec. 36.	33.41
BLM-0911102-PD	Monroe	T. 66 S., R. 27 E. Sec. 34, Lot 5.	1.36
BLM-0911102-PD	Monroe	T. 66 S., R. 27 E. Sec. 34, (Check for ROW)	1.36
BLM-0911102-PD	Monroe	T. 66 S., R. 32 E. Sec. 10, All.	Unknown
None	Okeechobee	T. 35 S., R. 32 E. Sec. 10, All. 11, All; and 12.	639.04 641.52 643.20
BLM-0911102-PD	Polk	T. 28 S., R. 28 E. Sec. 9, Lot 3; Sec. 10, Lot 2; Sec. 15, Lot 2; Sec. 16, Lots 3, 4, 5 & 6.	Unknown
None	Seminole	T. 20 S., R. 30 E. Secs. 33, 34, 35, 36, 41 & 42.	Unknown
BLM-911102-PD	Suwanee	T. 3 S., R. 11 E. Sec. 32, Lot 8.	3.00

1. Surface tracts that may be public lands but have conflicting ownership records.

2. Surface tracts with unknown acreage are located within, but do not necessarily comprise all, the area identified in the legal description column.

Table B-3. Withdrawn Lands in Florida

Serial or Public Land Order No.	Agency/Use	Legal Description	'Acres
FL-ES-033517	Air Force/ Military	T. 6 S., R. 12 W. Sec. 7, Lots 12 & 13; Sec. 16, That part lying west of longitude 85 degrees 27' 30" west; Sec. 17, Lots 7 - 10; Sec. 18, Lots 1, 2 & 3; T. 6 S., R. 13 W. Sec. 1, Lot 11; Sec. 2, Lot 2; Sec. 11, Lots 1, 2, 6 - 8, SWNE; Sec. 12, Lots 1 - 7; Sec. 13, Lots 1, 2 & 3.	1,744.86
FL-ES-033519	Air Force/ Military	T. 5 S., R. 14 W. Sec. 11, FRL.	14.35
FL-ES-033524	Air Force/ Military	T. 5 S., R. 13 W. Sec. 10, Lots 1, 2 & 3.	120.22
Total	Air Force		1879.44
FL-BLM-039552	Corps of Engineers/ Reservoir Project	T. 7 N., R. 8 W. Sec. 36, N2 Lot 3.	40.00
Total	Corps of Engineers		40.00
FL-BLM-038000	Forest Service/ Administration Sites for Recreation	T. 12 S., R. 24 E. Sec. 2, SESESE; T. 13 S., R. 26 E. Sec. 18, S2 Lot 3; T. 15 S., R. 24 E. Sec. 24, SWNW; T. 15 S., R. 25 E. Sec. 8, NWSW; Sec. 17, Part Lot 3 SW; Sec. 24, SWNW; T. 15 S., R. 27 E. Sec. 28, Lot 5; T. 15 S., R. 27 E. Sec. 28, Lot 5;	477.60

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
FL-BLM-039824	Forest Service/ Administration Sites for Recreation	T. 16 S., R. 26 E. Sec. 31, Lots 3 & 4;	1,476.65
		T. 17 S., R. 25 E. Sec. 4, N2SW, SENE, NWSE.	
FL-BLM-040523	Forest Service/ Roadside	T. 17 S., R. 26 E. Sec. 7, E2NWSW, W2NESW, NESESW; Sec. 12, SW; Sec. 17, SWSE;	2,133.00
		T. 17 S., R. 25 E. Sec. 10, W2SW, SESW; T. 16 S., R. 25 E. Sec. 7, Lots 3 & 4; Sec. 12, Lot 2; Sec. 20, NWSE, E2E2; Sec. 32, W2NE; T. 15 S., R. 25 E. Sec. 12, SWSW; Sec. 13, NWSW, W2NW; T. 14 S., R. 24 E. Sec. 11, NENE; Sec. 12, SWSW; Sec. 14, NENE; Sec. 19, W2NW, NWNE; Sec. 20, NWNW; Sec. 21, SESESE, NWNW, SESE; Sec. 22, SWSWSW, SWSW; Sec. 23, NENE; Sec. 27, NWNWNW; Sec. 28, NENENE; Sec. 33, S2SE; T. 14 S., R. 26 E. Sec. 11, NENE; T. 13 S., R. 25 E. Sec. 8, SENE; Sec. 20, SWSE, SESW; T. 12 S., R. 24 E. Sec. 6, W2SE; Sec. 24, NESW, NWSE; Sec. 28, SESW, SWSW;	

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
		Sec. 23, N2; Sec. 24, NWNW, E2NW, NE; T. 15 S., R. 25 1/2 E. Sec. 24, S2; T. 15 S., R. 26 E. Sec. 19, S2N2; Sec. 20, SWNW, W2SENW, SESENW, S2SWNE, N2NWSW; Sec. 21, NESW, SENW, S2 Lot 1, N2 Lots 2 & 3; Sec. 25, Lot 1; T. 15 S., R. 27 E. Sec. 20, Lot 3; Sec. 28, Lots 2 & 3; Sec. 29, NENW, NE; Sec. 30, SW, W2 Lot 4; Sec. 31, W2SW, NWSE, NESW, SENW, NWNW; T. 14 S., R. 24 E. Sec. 11, SESE; Sec. 12, NWSE, N2SW, S2NE, NENE; Sec. 14, SENW, NWNE; T. 14 S., R. 25 E. Sec. 5, Lots 1 & 2, S2 Lots 3 & 4, W2SW, NESW; Sec. 6, SESW, SE; Sec. 7, W2NW, NENW; T. 14 S., R. 26 E. Sec. 24, E2V/2NE, W2SENE, E2W2SE; Sec. 25, E2W2NE; Sec. 36, E2 Lot 1; T. 13 S., R. 24 E. Sec. 10, W2SE; Sec. 12, S2SE; Sec. 14, N2N2; T. 13 S., R. 25 E. Sec. 12, Lots 5, 10 & 11; Sec. 18, N2NW; Sec. 33, S2SW.	
FL-BLM-073066	Forest Service/ Administration Sites for Recreation	T. 12 S., R. 25 E. Sec. 22, S2SENE, N2SE, SENESW; Sec. 23, S2N2, N2S2, SESE; Sec. 27, S2NE; Sec. 35, N2NW;	4,466.40

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	1 Acres
		T. 12 S., R. 25 E. Sec. 26; S2SW, NWSW; T. 13 S., R. 25 E. Sec. 8, N2SE, SWNE; T. 13 S., R. 26 E. Sec. 11, Lot 1; T. 14 S., R. 24 E. Sec. 11, NESE; Sec. 14, SWSE; Sec. 36, W2NE; T. 14 S., R. 26 E. Sec. 15, SWNW, SESW; Sec. 33, Lots 2 & 3; T. 15 S., R. 25 E. Sec. 5, Lots 3 & 4; Sec. 6, Lots 2 & 3; Sec. 7, S2NE, SE; Sec. 8, SWNW, SWSW; Sec. 17, Lot 1, W2W2SE, W2SWNE, SENW; Sec. 18, Lot 1; Sec. 20, W2NWNE; Sec. 29, Lot 1; Sec. 32, Lots 2 - 4; T. 15 S., R. 26 E. Sec. 17, SENESW, E2SESW, S2N2SE, S2SE; Sec. 20, N2NE, N2SWNE, E2NENW, NESENW; Sec. 21, Lot 1, N2SENW. T. 15 S., R. 27 E. Sec. 29, S2SENE, N2NESE, SWNE, NWSE, SENW, NESW; Sec. 30, W2NWSE, and SWSE; Sec. 32, S2SE, E2SW; Sec. 33, W2SW; T. 16 S., R. 27 E. Sec. 5, NESE, NENW; T. 16 S., R. 25 E. Sec. 22, W2SE, NESW; Sec. 27, W2W2; Sec. 28, E2NE, NESE; Sec. 32, NESE, N2SW; Sec. 34, SWNW, NWSW; T. 16 S., R. 26 E. Sec. 13, Lots 4, 7 & 8, S2 Lot 9, N2NWNW; Sec. 14, N2NENE, SWNW, NWSW; Sec. 26, S2NENE, N2SESE; Sec. 36, E2NWNW, W2NENW;	

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
		T. 16 S., R. 27 E. Sec. 5, NESW; Sec. 20, Lots 2 & 3; T. 17 S., R. 25 E. Sec. 4, SWNE; Sec. 17, NENE; T. 17 S., R. 28 E. Sec. 2, S2 Lot 7.	
Total	Forest Service		8,553.65
FL-ES-033509	Fish & Wildlife Service Welacka Fish Hatchery	T. 12 S., R. 26 E. Sec. 3, M & B; Sec. 4, M & B; Sec. 14, Lots 4 & 5; Sec. 23, Lot 3, 4, 6, W2NW, NENW, N2SENW, S2SENW; Sec. 40, M & B; Sec. 41, M & B.	Unknown
FL-ES-033510	Fish & Wildlife Refuge Great White Heron	T. 65 S., R. 27 E., All; T. 65 S., R. 28 E., All; T. 65 S., R. 30 E. Secs. 13 - 36; T. 65 S., R. 31 E., All; T. 66 S., R. 25 E., All; T. 66 S., R. 26 E., All; T. 66 S., R. 27 E. Secs. 1 - 21, 24, 29 - 31; T. 66 S., R. 29 E. Secs. 1 - 3, 5, 6, 11, 12, & 14; T. 66 S., R. 30 E. Secs. 1 - 10; T. 67 S., R. 25 E. Secs. 1 - 18; T. 67 S., R. 26 E. Secs. 1 - 11; 16 - 18 & 20.	Unknown
FL-ES-033512	Fish & Wildlife Refuge St. Marks	T. 5 S., R. 1 E. (Unsurveyed) T. 5 S., R. 2 E. (Unsurveyed)	118.00

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
		T. 4 S., R. 2 E. Sec. 10, NWSE.	
FL-ES-033513	Fish & Wildlife Service Refuge Matlache Pass	T. 45 S., R. 23 E. Secs. 19, 31 & 32. (Islands)	Unknown
FL-ES-033514	Fish & Wildlife Service Refuge Pine Island	T. 44 S., R. 21 E. Secs. 2 & 5. (Unsurveyed Islands)	Unknown
FL-ES-033515	Fish & Wildlife Service Refuge Island Bay	T. 42 S., R. 21 E. Secs. 12, 13, 14, 17-36. (Unsurveyed Islands)	Unknown
FL-ES-033516	Fish & Wildlife Service Refuge Key Deer	T. 66 S., R. 27 E.	57.23
FL-ES-033522	Fish & Wildlife Service Refuge Ocala	T. 14 S., R. 24 E. Metes & Bounds; T. 14 S., R. 25 E. Metes & Bounds; T. 14 S., R. 26 E. Metes & Bounds; T. 15 S., R. 25 E. Metes & Bounds; T. 15 S., R. 26 E. Metes & Bounds; T. 15 S., R. 27 E. Metes & Bounds; T. 16 S., R. 25 E. Metes & Bounds; T. 16 S., R. 26 E. Metes & Bounds.	10,801.12

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
FL-ES-033523	Fish & Wildlife Service Refuge Cedar Keys	T. 15 S., R. 12. E. Secs. 35 & 36; T. 16 S., R. 12 E. Secs. 2, 3, 11 & 12; T. 16 S., R. 13 E. Sec. 8.	366.11
FL-ES-033525	Fish & Wildlife Service Refuge Key West	T. 67 S., R. 21 E. T. 67 S., R. 22 E. T. 67 S., R. 23 E. T. 68 S., R. 21 E. T. 68 S., R. 22 E. T. 68 S., R. 23 E. (Keys and Islands)	Unknown
FL-ES-033527	Fish & Wildlife Service Refuge Anclote	T. 26 S., R. 14 E. Sec. 24, Lot 1; Sec. 25, Lot 1; Sec. 36, Lot 1; T. 26 S., R. 15 E. Sec. 19, Lots 1 & 3; Sec. 30, Lots 1 & 2; Sec. 31, M & B; Sec. 33, (Unsurveyed Island); Sec. 34, (Unsurveyed land); T. 27 S., R. 15 E. Secs. 3 & 4, (Unsurveyed Islands); Sec. 6, Lot 1.	237.45
FL-BLM-044365	Fish & Wildlife Service Refuge Sanibel	T. 46 S., R. 21 E. Sec. 12, Lots 3 & 4; T. 46 S., R. 22 E. Sec. 7, Lots 1 & 2; Sec. 8, Lots 2 & 3; Sec. 17, Lot 6; Sec. 18, Lots 3 & 4; Sec. 23, SESE; Sec. 24, SWSW; T. 46 S., R. 23 E. Sec. 19, NWNE, NENW.	636.96

Table B-3. Continued.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
FL-BLM-073083	Fish & Wildlife Service Refuge Pelican Island	T. 31 S., R. 39 E. Secs. 4, 5, 8, 15, 16, 21 & 22. (Unsurveyed Lands/Islands)	523.00
FL-ES-008226	Fish & Wildlife Service/ Refuge St. Vincent	T. 9 S., R. 11 W. Sec. 7, Lot 9; Sec. 17, Lots 2 & 3; Sec., Lot 8.	45.33
Total	Fish & Wildlife Service		12,785.20
FL-ES-033511	Nat. Park Service Natl. Monument	T. 9 S., R. 30 E. Sec. 24, Lots 2, 3 & 4.	89.42
Total	National Park Service		89.42
FL-BLM-075082	NASA Space Exploration	T. 20 S., R. 36 E. Sec. 10, FRL; T. 21 S., R. 36 S. Sec. 13, Lot 6; T. 21 S., R. 37 E. Sec. 18, Lot 6; T. 22 S., R. 36 S. Sec. 35, SESW, NWSW; T. 22 S., R. 37 E. Sec. 19, Lot 26; Sec. 30, Lot 47; T. 23 S., R. 37 E. Sec. 9, Lot 1.	133.21
Total	NASA		133.21
FL-ES-033520	Navy/ Military	T. 4 S., R. 15 W. Sec. 4, Lot 10.	1.23
FL-ES-033521	Navy/ Military	T. 43 S., R. 20 E. Sec. 23, 1 - 6; Sec. 24, Lot 1; Sec. 26, Lots 1, 2, & 3; Sec. 35, Lot 1 & 2; Sec. 36, Lots 1, 2 & 3;	1,708.59

Table B-3. Concluded.

Serial or Public Land Order No.	Agency/Use	Legal Description	¹ Acres
		T. 44 S., R. 20 E. Sec. 1, Lots 1 - 11; Sec. 2, Lot 1; Sec. 12, Lots 1 - 3, S2NE; T. 44 S., R. 21 E. Sec. 6, Lot 1; Sec. 7, Lots 1 - 3.	
FL-BLM-042163	Navy Flight Approach Protection Zone	T. 67 S., R. 25 E. Sec. 25, Lot 2.	0.26
Total	Navy		1,710.08
FL-ES-035674	U. S. Coast Guard Lighthouse Cape San Blas	T. 9 S., R. 11 W. Sec. 20, Lots 8 & 9; Sec. 29, Lots 6 - 10, 14 & 15.	480.00
FL-ES-037416	U. S. Coast Guard Lighthouse Anclote Key	T. 27 S., R. 15 E. Sec. 6, Part Lot 1.	0.17
FL-ES-041063	U. S. Coast Guard Lighthouse Jupiter Inlet	T. 40 S., R. 43 E. Sec. 31, Lots 1, 8 & 11.	121.96
Total	U. S. Coast Guard		602.12

1. Tracts with unknown acreage are located within, but do not necessarily comprise all, the area identified in the legal description column.

Table B-4. Lands Patented under the Recreation and Public Purposes Act.

Serial or Patent No.	Location/Holder	Approved Land Use	Acres
FL-ES-005080	Bay County/ Panama City- Bay County Airport and Industrial District	Public Purpose	2.86
FL-BLM-010396	Bay County State of Florida Gulf Coast Junior College	Public Purpose	14.07
FL-BLM-010396	Bay County/ State of Florida	Recreation	248.80
FL-BLM-017672	Brevard County/ Brevard County Board of Commissioners	Recreation Public Purpose	173.28
FL-BLM-039557	Clay County/ State of Florida	Recreation	320.15
FL-GLO-006296	Clay County/ State of Florida	Recreation	160.00
FL-ES-032095	Collier County/ State of Florida	Recreation	39.65
FL-BLM-042641	Columbia County/ State of Florida	Recreation	40.00
FL-BLM-079812	Columbia County	Recreation	44.00
FL-ES-031478	Escambia County/ State of Florida	Recreation	39.91
FL-BLM-017976	Flagler County/ State of Florida	Recreation	138.76
FL-BLM-017976	Flagler County/ City of Flagler Beach	Public Purpose	0.62

Table B-4. Continued.

Serial or Patent No.	Location/Holder	Approved Land Use	Acres
FL-BLM-041971	Gadsden County/ The Charles Henry Dupont Foundation for Forestry and Pastures	Public Purpose	40.00
FL-BLM-077339	Gulf County/ State of Florida	Recreation	98.05
FL-ES-011972	Gulf County/ Gulf County Board of Commissioners	Recreation	42.48
FL-ES-0338176	Gulf County/ Gulf County Board of Commissioners	Recreation	39.93
FL-BLM-016511	Indian River County/ City of Vero Beach	Recreation	8.28
FL-BLM-047546	Lee County/ State of Florida	Recreation	77.79
FL-BLM-049972	Lee County/ State of Florida	Recreation	70.37
FL-BLM-053683	Lee County/ State of Florida	Recreation	78.63
FL-BLM-058464	Lee County/ State of Florida	Recreation	429.05
FL-ES-032093	Lee County/ State of Florida	Recreation	1.29
FL-ES-032094	Lee County/ State of Florida	Recreation	75.00
FL-ES-032095	Lee County/ State of Florida	Recreation	39.65
FL-ES-032322	Lee County/ State of Florida	Recreation	4.06
FL-ES-032323	Lee County/ State of Florida	Recreation	17.43

Table B-4. Continued.

Serial or Patent No.	Location/Holder	Approved Land Use	Acres
FL-ES-032417	Lee County/ Lee County Board of Commissioners	Recreation	30.00
FL-ES-004189	Levy County Levy County Board of Commissioners	Recreation	477.12
FL-BLM-031615	Martin County/ Martin County Board of Commissioners	Recreation	16.56
FL-BLM-079795	Okaloosa County/ Okaloosa County Board of Public Instruction	Public Purpose	40.06
FL-BLM-059684	Okaloosa County/ Okaloosa County Board of Public Instruction	Public Purpose	29.92
FL-BLM-022171	Palm Beach County/ Palm Beach County Board of Commissioners	Recreation	80.44
FL-BLM-040024	St. Johns County/ St. Johns County Board of Commissioners	Public Purpose	12.12
FL-BLM-040024 Certificate No. 33	St. Johns County/ St. Johns County Board of Commissioners	Public Purpose	2.87
FL-BLM-016175	St. Lucie County/ St. Lucie Board of County Commissioners	Recreation	43.80
FL-ES-003893	Santa Rosa County/ Santa County Board of Commissioners	Recreation	1.75

Table B-4. Concluded.

Serial or Patent No.	Location/Holder	Approved Land Use	Acres
FL-BLM-062856	Santa Rosa County/ City of Gulf Breeze	Public Purpose	153.33
FL-ES-003388	Sumter County/ Sumter County Board of Commissioners	Recreation	11.57
FL-ES-002422	Walton County/ Walton County Board of Commissioners	Recreation	3.54
FL-BLM-022235	Volusia County/ State of Florida	Recreation	73.50
FL-ES-041956*	Walton County/ Walton County Board of Commissioners	Recreation	19.52
FL-ES-041959*	Walton County/ Walton County Board of Commissioners	Recreation	0.49

* These tracts are leased under provision of the Recreation and Public Purposes Act and are not patented.

Table B-5. Summary of Split-estate Federal Mineral Ownership (FMO) by County.

Acreage of Federal Mineral Ownership Reserved					
County	All Minerals	Oil & Gas Only	Phosphate Only	Oil, Gas & Phosphate	Total
Alachua	32	0	295	10	337
Baker	0	148	258	0	406
Bay	1,400	81	0	0	1,481
Bradford	44	0	26	0	70
Brevard	744	41	0	0	785
Broward	0	0	0	0	0
Calhoun	0	207	0	0	207
Charlotte	0	0	2,869	0	2,869
Citrus	42,470	163	2,585	1,065	46,283
Clay	172	0	446	0	618
Collier	0	665	0	0	665
Columbia	80	0	659	21	760
Dade	0	0	0	0	0
Desoto	0	0	289	72	361
Dixie	0	151	5,235	88	5,474
Duval	0	0	0	0	0
Escambia	132	118	0	0	250
Flagler	50	0	0	0	50
Franklin	0	0	0	0	0
Gadsden	0	159	737	0	896
Gilchrist	0	0	3,500	260	3,760
Glades	0	0	7,000	0	7,000
Gulf	0	0	0	0	0
Hamilton	145	116	263	41	565
Hardee	0	0	2,668	0	2,668
Hendry	0	73	924	0	997
Hernando	35,426	155	323	0	35,904
Highlands	0	211	11,929	0	12,140
Hillsborough	0	0	237	0	237
Holmes	0	454	0	0	454
Indian River	1	0	99	0	100
Jackson	4,364	38	0	0	4,402
Jefferson	3,527	0	0	0	3,527

Table B-5. Concluded.

Acreage of Federal Mineral Ownership Reserved					
County	All Minerals	Oil & Gas Only	Phosphate Only	Oil, Gas & Phosphate	Total
Lafayette	46	0	1,426	40	1,512
Lake	0	21	254	0	275
Lee	230	0	2,829	0	3,059
Leon	436	0	178	175	789
Levy	401	394	5,606	322	6,723
Liberty	123	0	747	165	1,035
Madison	1,442	41	876	43	2,402
Manatee	0	103	4,935	0	5,038
Marion	51	85	2,681	0	2,817
Martin	15	0	0	0	15
Monroe	341	7	0	0	348
Nassau	0	0	42	0	42
Okaloosa	60,442	122	0	0	60,564
Okeechobee	0	0	35	0	35
Orange	0	0	162	0	162
Osceola	0	0	95	0	95
Palm Beach	0	0	0	0	0
Pasco	6,780	0	255	0	7,035
Pinellas	0	0	0	0	0
Polk	54	39	6,396	22	6,511
Putnam	176	229	296	0	701
Santa Rosa	122,083	176	0	0	122,259
Sarasota	0	0	1,273	0	1,273
Seminole	0	0	112	0	112
St. Johns	0	54	0	0	54
St. Lucie	0	0	0	0	0
Sumter	33,311	0	720	79	34,110
Suwannee	0	13	434	0	447
Taylor	281	170	1,351	0	1,802
Union	124	0	165	141	430
Volusia	91	36	0	0	127
Wakulla	81	0	0	0	81
Walton	1,547	724	0	0	2,271
Washington	78	445	0	0	523

Table B-6. Estimated FMO acreage under State Managed Surface Land.

Site	Acres
Blackwater River State Forest	182,000
Withlacoochee State Forest	118,000
Cayo Costa State Park	200
Charlotte Beach State Recreation Area	30
Goldhead Branch State Park	160
Lake Manatee Recreation Area	40
Manatee Springs State Park	40
Myakka River State Park	80
River Rise State Park	160
State Andrews State Park	540
Apalachee Wildlife Management Area	3,400
Camp Blanding Wildlife Management Area	160
Cecil W. Webb Wildlife Management Area	1,600
Gulf Hammock Wildlife Management Area	250
La Floresta Perdida Wildlife Management Area	125
Point Washington Wildlife Management Area	1,390
Steinhatchee Wildlife Management Area	440
Telologic Creek Wildlife Management Area	230
Indian River Aquatic Preserve	50
TOTAL	308,895

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Appendix C

Oil and Gas

Introduction

This appendix has been prepared to provide the reader a better understanding of the oil and gas leasing and development process and of the methodology used to evaluate resource potential. In addition, an assessment of reasonably foreseeable development is provided, and lease stipulations are presented.

Leasing and Development

This section first describes BLM Standard Management of the leasing process and then describes the typical operations and BLM Standard Management for each phase of the exploration and development process, including geophysical, drilling and production operations and, finally, well-site abandonment and reclamation. This should be viewed as a general overview and not as a detailed statement of regulatory requirements.

Standard Management of Leasing

Prior to any drilling operations, the property must be leased. BLM administers the leasing of onshore oil and gas on public domain and acquired lands. Onshore oil and gas leasing for most public domain and acquired lands is authorized under the Mineral Leasing Act of 1920 and the Mineral Leasing Act for Acquired lands of August 7, 1947. Certain lands are excluded from leasing under these Acts for a variety of reasons including environmental conflicts, national defense, or authority granted under other acts. Exclusions that are applicable in the planning area include, but are not limited to, the following:

(a) National parks and monuments;

(b) Indian reservations (public domain only);

(c) Incorporated cities, towns and villages;

(d) Tidelands or submerged coastal lands within the continental shelf adjacent, or littoral to lands within the jurisdiction of the United States (acquired lands only); or,

(e) Lands acquired by the United States by foreclosure, or otherwise for resale.

Where oil or gas is being drained from lands otherwise unavailable for leasing, there is implied authority in the agency having jurisdiction of those lands to grant authority to the Bureau of Land Management to lease such lands (see 43 U.S.C. 1457; also Attorney General's Opinion of April 2, 1941 (Vol. 40 Op. Atty. Gen. 41)).

All lands must be exposed to competitive lease sales for a legislated minimum \$2.00 per acre bid. Lands which do not receive competitive bids are available for non-competitive leasing for a period not to exceed two years. Parcel size may not exceed 2,560 acres. The lease term is 10 years. Royalty rate is 12 1/2 percent for both competitive and non-competitive leases, and rental is \$1.50 per acre for the first five years, and \$2.00 per acre thereafter for all leases.

Sales are held on a quarterly basis, and public notice is provided 45 days prior to offering lands for lease. Leases may not be issued, or assignments approved, to parties who have failed to properly reclaim a leasehold.

A lessee has a right to use the leased lands, as necessary, to explore for, drill for, extract, remove, and dispose of all the leased resources in a leasehold. This right is subject to stipulations

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attached to the lease, restrictions derived from specific, non-discretionary statutes, and such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses, or users not addressed in the lease stipulations at the time operations are proposed. Federal oil and gas leases include standard lease terms many of which are designed to protect other natural resources. Special stipulations are developed on a case-by-case basis to respond to specific environmental concerns for a particular lease area. Special stipulations are developed by the appropriate SMA and BLM through completion of an environmental analysis. Such stipulations limit the lessee's use of the lease. Examples are when portions of the lease cannot be occupied due to resource conflicts, such as the presence of archeological sites, residential areas, threatened or endangered species, or cannot be used during certain times of the year because of wildlife, watershed, conflicting land use, or other concerns. Special stipulations are attached to the lease instrument.

When measures not included in the lease terms are added to an operational permit, they are included as Conditions of Approval. Such conditions are considered consistent with the lease rights granted provided that they do not: require relocation of proposed operations by more than 200 meters; require that the operations be sited off the leasehold; or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year.

Geophysical Operations

Typical Geophysical Operations

Three subsurface characteristics are usually measured by geophysical methods: gravitational field, magnetic field, and seismic characteristics.

A seismic survey is a method of gathering subsurface geological information by recording impulses from an artificially generated shock wave. The common procedure used in reflection seismic

surveys on land consists of creating shock waves and recording, as a function of time, the resultant seismic energy as it arrives at groups of vibration detectors (1/2- to 5-pound seismometers or jugs) arrayed on the ground at spaced intervals. These arrays of seismometers are connected to a recording truck that receives and records the reflected seismic energy.

The seismic sensors and energy source are located along lines on a 1- to 2-mile grid. Some surveys may be laid out in excess of 40 miles in a series of grid patterns, or in a single line.

Seismic methods are usually referred to by the various methods of generating the shock wave. These include the thumper, vibroseis, dinoseis, and explosive methods.

Historically, explosives have been the most widely used way to generate seismic shock waves. Under this method, a 5- to 20-pound of explosive charge is detonated at the bottom of a 25- to 200-foot drill hole. The hole is usually two to six inches in diameter and is drilled with a truck-mounted rig.

Standard Management of Geophysical Operations

Permitting

BLM has jurisdiction over approval of geophysical operations only on public domain surface. For lands other than public domain, approval is obtained from the land owner or SMA. In the east, very little public domain surface exists. Consequently, requests for approval of geophysical operations are rare. The procedures are addressed in 43 CFR Part 3150 and include the filing of a Notice of Intent to Conduct Oil and Gas Exploration Operations. The completion and signing of the notice signifies agreement to comply with the terms and conditions of the notice. Upon completion of the operation, the applicant shall file a Notice of Completion of Oil and Gas Exploration Operations. Within 30 days after the filing, the applicant will be notified by BLM and advised as

to whether or not the terms of the notice of intent have been met and whether any additional reclamation is required.

Best Management Practices

Where possible, existing roads are used to conduct seismic operations. Some lines may require clearing of vegetation and loose rock to improve access for trucks. Each mile of line cleared to a width of eight to 14 feet represents disturbance of about an acre of land. Standard reclamation practices include filling the shot holes, general cleanup, repair of structures such as fences, and seeding disturbed areas as needed.

Drilling Operations

Typical Well Site and Road Construction

Construction of the well site and access road requires use of several types of construction equipment, including bulldozers, backhoes, and motor graders.

Access roads for oil and gas operations are generally low volume, single-lane roads, which may be reclaimed after a particular use terminates. Existing roads may need improvements, including crowning and ditching and surfacing. New roads are usually constructed with a 12- to 14-foot wide travel way and a 30-foot right-of-way.

A typical well site consists of a well pad and a reserve pit. The pad accommodates the rig and associated facilities such as pumps, mud tanks, generators, and pipe racks. The size and shape of the well site varies with the depth of the well and the topography. In general, deeper wells require larger drill rigs and larger well sites. On a relatively level surface, the well site is typically square and ranges in size from 100 feet by 100 feet to 450 feet by 450 feet. The average size in the planning area is approximately 400 feet by 400 feet without protection.

A reserve pit, to contain waste drilling fluids and drill cuttings, is constructed within the well site along one side. The dimensions of the pit will vary with the depth of the well and the method of drilling. Deep wells and mud-drilled wells usually require a larger reserve pit than shallow wells and air-drilled wells. A typical reserve pit in the planning area is 150 feet by 400 feet and 6 feet in depth.

The pit may be lined with a synthetic liner or bentonite to inhibit seepage.

Typical Drilling Operations

Drilling is normally accomplished by rotating a bit at the end of the drill string under pressure. The rig employs a hoist system (which consists of a derrick, crown block, and traveling block) to lift and lower the bit. The drill bit is fastened to and rotated by a hollow drill string, with sections or joints being added as drilling progresses. As the bit cuts into the rock, the cuttings are pushed up the hole by compressed air (air drilling) or a mixture of water, clay, and chemical additives (mud drilling). Drilling in the planning area is typically accomplished with mud-drilling systems. The drilling fluid or mud lubricates and cools the bit, maintains downhole pressure control, and helps bring the cuttings to the surface. Some mud additives are caustic, toxic, or acidic. When used, additives constitute an extremely small portion of the total mud volume. The air or mud is pumped down the drill pipe, exits through holes in the bit, and returns to the surface outside the drill string. At the surface, the returning fluid (mud) is typically diverted through a series of tanks or pits, where the cuttings separate from the mud. In many cases, shale shakers, desanders, and desilters are also used to aid in separating cuttings from fluid. The cuttings removed from the mud are typically disposed of in a reserve pit.

After the cuttings are removed, the mud is picked up by pump suction, and the cycle is repeated. Closed systems are sometimes used in sensitive areas. In a closed system, a reserve pit is not constructed. The mud is maintained in tanks and reused until depleted.

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The initial hole is drilled to a depth of about 100 feet, and a conductor pipe, or casing, is cemented in. A series of blowout preventer (BOP) valves is attached to the well. Drilling is resumed after the installation of casing and BOP valves, using a smaller bit. When the drilling depth reaches several hundred feet, the drill string and bit are pulled out of the hole and surface casing is lowered into the hole, and cemented in. The depth of surface casing depends on the location of underground sources of drinking water, formation pressures, and the tendency of the bore to slough. During the drilling process, the drilling string is pulled from the hole periodically to change the bit, install casing, and/or remove core samples from the well bore. Usually, 90-foot joints made of 30-foot sections are successively lowered into the hole until the final depth is reached.

Drilling operations are continuous, 24 hours a day. Drilling usually lasts 20 to 45 days in the planning area, depending upon well depth and problems encountered. From 5,000 to 15,000 gallons of water a day may be needed for mixing drilling mud, cleaning equipment, cooling engines, and other aspects of the drilling operation. A surface pipeline may be laid to a stream, or a water well, or the water may be trucked to the site from creeks, ponds, or streams in the area.

When total depth of the well is reached one or more of the following completion operations must be conducted in most wells: (1) logging, which indicates porosity, permeability, and saturation of the formation, (2) testing of the formation fluids through the drill stem, (3) installing and perforating the production casing to allow production of the formation, and (4) formation stimulation, which is usually fluid fracture or acid dissolving of the formation to increase the flow capacity of the formation. If producible oil and gas is discovered, the well will be shut-in until production facilities are installed. If producible amounts of oil and gas are not encountered, the well will be plugged and abandoned.

Standard Management of Drilling Operations

Permitting

Onshore oil and gas operations are subject to Federal regulations contained in Title 43 CFR Part 3160, "Onshore Oil and Gas Operations." After lease issuance, and prior to approval of any drilling activities within the area of the lease, the operator must submit an Application for Permit to Drill (APD) as required by Onshore Oil and Gas Order No. 1. The APD provides operational and geologic information as well as the applicant's proposal for use of the surface. Bonding coverage must be obtained by the applicant before approval.

The applicant's proposal for use of the surface is provided in the APD as a Surface Use Program. This program provides a detailed description of the existing roads, proposed access road location and design, location of existing wells, proposed production facilities, water supply, construction materials, waste disposal, ancillary facilities, well site layout, plans for surface reclamation, surface ownership, lessee's or operators representative, and any other additional information that may be helpful in processing the APD. Where private surface is involved, the program includes a copy of the written agreement between the lessee, or operator, and the surface owner.

A field inspection of the proposed drill site and access road is conducted by BLM and other interested parties. Other participants normally attending the inspection include the SMA for federal surface, the appropriate state agency on state lands, the surface owner on private lands, the operator, drilling contractor, dirt contractor, and any other interested parties. From this effort, site-specific requirements are formulated for the protection of affected resources. Although BLM has primary responsibility, it must have concurrence from any other SMA.

The environmental impacts of the proposed drilling operation are assessed through the preparation of an appropriate environmental document. As part of the review process, state and federal

agencies possessing special expertise in the management of a particular resource are consulted in order to obtain their advice as to the impact of the proposal to a specific resource. Examples of agencies consulted include the USFWS, concerning threatened or endangered species, and the SHPO, concerning cultural resources.

Best Management Practices

Well Site. Well sites should be located on the most level location available that will accommodate the intended use. The site layout should be oriented to conform to the best topographic situation, given the geologic target and any safety considerations. However, safety considerations may be an overruling factor (such as operations in a hydrogen sulfide area). Steeply sloping locations which require deep, nearly vertical cuts and steep fill slopes should be avoided. Generally, cut-and-fill slopes on the perimeter of the well pad are not to exceed 3:1 (three-foot horizontal for each one foot vertical). The location of the well site should also be selected considering the effect upon the location of the access road. Advantages gained on a good well site or tank battery location may be negated by adverse effects of the access road location.

Construction must conform to the approved surface-use program. Generally, all topsoil shall be removed from the entire construction site, including the fill area, and stockpiled. The depth of topsoil to be stripped and stockpiled should be determined at the pre-drill inspection, and/or stated in the proposed surface-use plan. Soil stockpiles should be located to avoid mixing with subsurface materials during construction and reclamation. Stockpiles should be located so wind and water erosion are minimized.

Fills should be compacted to minimize the chance of slope failure. If appropriate, terraces can be used on cut-and-fill slopes to reduce land impacts and to prevent excessive water accumulation and erosion. If excess cut material exists after fill areas have been brought to grade, the excess material may be disposed of or stockpiled at approved locations.

The area of the well pad that supports the drilling rig substructure must be level, and capable of supporting the rig. Ideally, the rig should be located on cut material. The drill rig is not to be placed on uncompacted fill material. Runoff water from off-site areas should be diverted away from the well site by ditches, waterbars, or terraces above the cut slopes.

The reserve pit should be located in cut material. On steep slopes, this may not be entirely possible. In such cases, at least 50 percent of the reserve pit should be constructed below original ground level to prevent failure of the pit dike. Fill dikes must be compacted. The necessary degree of compaction depends on soil texture and moisture content.

It may be necessary to line reserve pits to inhibit seepage. A synthetic liner should consist of a reenforced polymer type with a minimum thickness of 10 millimeters. Compacted native clay and bentonite is also commonly used. The thickness of the clay/bentonite should be determined on a site-specific basis, but is generally one to two feet. In some areas, a closed mud system may be required.

Access Roads. Drainage must be provided for the entire road. Usually this is accomplished by use of drainage ditches and culverts.

Normal road gradients should not exceed 8 percent.

Culverts are used in two applications on access roads: (1) in streams and gullies to allow normal drainage to flow under the traveled way, and (2) to drain inside road ditches. All culverts should be laid on natural ground, or at the original elevation of any drainage crossed. Culverts should be placed on a 3 percent minimum grade. The outlet of all culverts should extend at least one foot beyond the toe of any slope.

Wetlands are especially sensitive areas. Generally, these areas require crossings which prevent unnatural fluctuations in water level. Marshy and swampy terrain may contain bodies of water with no discernible current. The design of culverts for

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roads crossing these locations requires some unique considerations. The culvert should be designed with nearly a flat grade so water can flow either way and maintain its natural water level on both sides. It may be partially blocked by aquatic growth, and installed with the flow line below the standing water level at its lowest elevation. Special attention must be given to the selection of culvert materials that will resist corrosion.

In some cases drainage crossing can be effectively accomplished by dipping the road down to the bed of the drainage. Material moved from the banks of the crossing should be stockpiled near the right-of-way. Gravel, riprap, or concrete bottoms may be required in some situations. In no case should the drainage be filled so that water will be impounded.

Production Operations

Typical Production Operations

After reaching the desired depth and determining that the well has tapped sufficient reserves to be economically developed, the well is completed. First, casing strings are cemented into the hole. A number of log tests, such as cement bond logs and temperature logs, may be run to determine the quality of the cement job. Operators use perforating guns to perforate the casing downhole. A perforating gun is lowered into the hole on a conductor cable by wireline until it reaches the depth of the pay zone or zone to be perforated. The perforating gun is then fired, penetrating the casing with bullets fired from the gun and creating channels from the formation to the well bore. Then the production tubing strings are set inside the casing to let the pay-zone fluids enter the cemented casing strings. A well may be completed with single completion (completion in one formation), multiple completion (completed in separate formations at the same time with separate production equipment for each formation); or commingled completion (completed in more than one formation at the same time using a common production system).

In some cases, after a well is completed, the formation does not show a promising amount of petroleum products as indicated on a well log or core samples. Operators use a variety of well-stimulation techniques to correct these problems during the development phases of the well. The two most often used techniques for stimulating a well are acidizing and fracturing. Fracturing increases the permeability of the formation in the area of the well bore and increases local pore size. Acidizing dissolves waxes, carbonates, and other materials clogging the area near the bore. Hydrochloric acid (HCl) is by far the most common used acid.

After wells are drilled and completed, they are ready to be produced. There are several types of recovery methods in production operations. The first is primary recovery, which uses natural flow and artificial lift to get the hydrocarbons to the surface. Most fields initially produce by primary recovery methods, but natural decline rate of wells indicates when workovers or other methods of recovery are needed to maintain or improve production.

Production activities include installation of production equipment and product treatment facilities, flowlines and pipelines, and disposal of produced water. Normally, when compared to gas production, oil production requires more tanks and treatment facilities. In addition, oil production facilities require more maintenance and have a greater potential for spills. In many cases, gas production is dry and does not require the use of tanks.

The oil and/or gas, and in some cases produced water, is transported to the production facilities through flowlines typically two to four inches in diameter. Flowlines may or may not be buried.

Production equipment which may be installed includes pumping units, tanks, dehydrators, separators, and meters. Tank batteries are used to store produced oil or condensate prior to sale, or produced water, prior to disposal. The tank battery and other treatment equipment is normally located on the well pad, or adjacent to the access

road. In developed fields, a centrally located facility may be used. A typical tank battery consists of two 200-barrel tanks for produced oil and one 200-barrel tank for produced water. These tanks are normally enclosed by a firewall designed to contain the fluids in the event of a spill.

Produced fluid at the wellhead is a complex mixture of gas, oil, water, and other impurities (such as sand and scale). A series of gravitational, chemical, and thermal treatment steps may be used to separate marketable gas and crude oil from the produced water and sand. Dehydrators and separators are used to separate the various petroleum products and remove water. This facility is typically located 150 feet from the well and tank battery.

Produced water is often high in chloride content. The water must be disposed according to federal and state standards. In most cases, the water is removed from the site and is disposed into the subsurface by an injection well.

Once treated, the oil is sold and removed either by truck or pipeline. Meters are used to measure the amount of gas produced before it is put into a transmission pipeline.

Pipelines transport oil or gas from the wells or production facility to a trunk line and then to the main transmission line from the area. Trunk lines are generally six to eight inches in diameter and are buried, as are transmission lines which vary in diameter from 10 to 36 inches. The area required to construct a flowline or pipeline varies from about 15 feet wide for a two- to four-inch surface line to 75 feet or more for transmission lines 24 to 36 inches in diameter. Surface disturbance is primarily dependent on size of the line and topography.

The first step in pipeline construction is to clear the right-of-way of any obstacles along the route such as vegetation, rocks, and abrupt surface irregularities. Next, topsoil over the trench location is removed and stockpiled on the side of the trench away from the working side of the

trench. Then trenchers or backhoes dig the trench in which the pipe will be laid. The ditch must be deep enough to allow three to five feet of cover over the pipeline. Fill excavated from the trench can be placed on either side of the trench taking care not to mix it with any topsoil that may be stockpiled.

After the trench is ready, the pipe is laid along the open trench in separate lengths. The lengths of pipe are positioned for welding together either by hand or side boom tractor.

The welds are inspected, pipe is cleaned, coated with tar, covered with fiberglass, and finally wrapped with tar paper, kraft paper, or asbestos felt. The pipe is then lowered into the ditch which is backfilled and compacted. The right-of-way is regraded to the original contour, and the topsoil is replaced. Compressor stations may be necessary to increase production pressure to the same level as pipeline pressure.

Standard Management of Production Operations

Permitting

The method used to approve operations and the installation of facilities subsequent to drilling depends on whether or not the facility is part of the leasehold operation. All facilities used for production, treatment, and transmission of oil and gas are considered leasehold facilities to the point where the product is sold. This includes facilities that are off-lease and authorized under an off-lease storage permit. Such facilities include storage tanks and processing facilities, sales facilities, all pipelines upstream from such facilities, and other facilities to aid production, such as water disposal lines and gas or water injection lines.

When such facilities require new construction, reconstruction, or alteration and surface disturbance will result, the proposal for installation of such facilities is subject to the same type of environmental review process used prior to drilling.

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Pipelines and other facilities beyond the point-of-sale must be approved by right-of-way permits, special-use permits, or permission of the land owner. BLM has approval authority over this category of facilities only on public domain surface. Such approvals are granted according to 43 CFR Part 2880.

Best Management Practices for Production Operations

All areas not needed for production purposes must be reclaimed in accordance with BLM and the SMA specifications. The locations selected for facilities such as tank batteries, pits, and pumping stations should be planned so as to minimize long-term disruption of the surface resources. Construction techniques and other practices should be employed that would minimize surface disturbance and effects on other resources, and maintain the reclamation potential of the site.

BLM regulations require that various equipment be used for safety purposes. This includes belt guards and guard rails on the pumping unit. Some of the design and operating standards for production operations required by the Jackson District are as follows:

All tanks must be enclosed with a firewall capable of containing 1 1/2 times the contents of the largest tank in the battery. Any crossing into the firewall must use a structure such as a small platform to prevent the wall from eroding.

In some cases, devices such as automatic shut down switches on production equipment or sump pumps within the tank battery firewall may be required to prevent spills.

Devices used to drain the area within the firewall, such as pipes, drains, siphon hoses, pumps, or the cutting of the wall, are prohibited. Any fluids contained within the firewall must be disposed in a manner specified by BLM.

Flowlines should be placed adjacent to the access road as much as possible. This reduces the impact to other areas, reduces the chance that

such lines will be accidentally cut by other activities, and provides a better means to monitor the lines for leaks.

Clamps may be used on steel flowlines to repair leaks, but may be used only as a temporary measure not to exceed 30 days.

Evaporation pits for disposal of produced water are not permitted.

Well Abandonment and Reclamation

Typical Abandonment and Reclamation

Well plugging and abandonment requirements vary with the rock formations, subsurface water, well depth, and other factors. Generally, however, the area below the surface casing is filled with heavy drilling mud, and cement plugs are installed at various points to protect aquifers and known oil and gas producing formations. In instances where the casing has not previously been cemented to the surface, operators may recover the casing prior to plugging the well. In such instances, the casing string may be cut above the last cemented zone, with cement used to plug the remaining casing below. Recovered casing may be used at other operations. In cases of production wells that are no longer economical, tubing and liners are pulled out of the well after the well-head assembly is removed. Cement plugs may be installed above and below fresh-water aquifers, and across all perforated zones. A final cement plug is set all the way to the surface, and finally, a concrete slab is placed on top of the cement plug at or below the ground.

A pipe monument giving the location and name of the well is required unless waived. If waived, the casing may be cut off below ground level.

Reclamation is normally initiated at two stages. Should a well be placed in production, the areas not needed for production must be reclaimed. If the well is dry or when the well is depleted, then abandonment and final reclamation is required.

A reclamation plan is part of the surface-use program of operations. Dry holes are immediately plugged following testing of the well. In most cases, wells that produce are plugged as soon as they are depleted. In some cases, depleted wells are not plugged immediately but are allowed to stand idle for possible later use in a secondary recovery program or other uses such as conversion to a disposal well. Surface flowlines and production equipment are removed.

One of the initial steps of drill site restoration is disposal of the mud. The drilling mud is normally disposed by one or more methods. Depending on the method used, this may occur before or after the plugging of the well. One method used prior to plugging is pumping the mud down the well. In the case of a dry hole, the mud is pumped directly through the surface casing. For a producing well, the mud is pumped behind the production casing. Another method consists of evaporation and burial of the mud on site. This may require spreading or trenching of the mud to promote rapid drying. Another method consists of off-site disposal in a commercial pit or surface discharge.

After plugging, the well pad, reserve pit, and access road are restored. This may include the use of dozers, graders, and backhoes to recontour the disturbed areas. This is typically followed by application of seed, fertilizer, and mulch.

Standard Management of Abandonment and Reclamation

Permitting

Well abandonment operations may not be started without prior approval of the BLM. The operator is required to submit a "Sundry Notices and Reports on Wells," Form 3160-5. The Sundry Notice serves as the operator's Notice of Intention of Abandonment. In the case of newly drilled dry holes or failures, and in emergency situations, oral approval may be obtained from the authorized officer subject to written confirmation by application. Abandonment will not be considered concluded until surface rehabilitation work, as re-

quired by the drilling and/or abandonment approval, is completed. The bond is retained by BLM until all requirements in the approvals are met.

Best Management Practices for Abandonment and Reclamation

All pits must be reclaimed to a condition similar to the rest of the reclaimed pad area. In addition, the reclaimed pit must be restored to a safe and stable condition. Pits are not to be filled while still containing fluids. The contents must be dry, or removed prior to filling. The pit area should be mounded to allow for settling. The mounding will also allow for positive surface drainage off the reclaimed pit. All other excavation or drill holes must be closed by backfilling once dry and graded to conform to the surrounding terrain.

Site preparation prior to seeding may include ripping, scarifying, contour furrowing, terracing, reduction of steep cut-and-fill slopes, water-barring, and/or other methods. The disturbed sites should be prepared to provide a seedbed for re-establishment of desirable vegetation and reshaped to blend with the natural contour.

Disturbed areas must be revegetated after the site has been satisfactorily prepared.

The operator will be advised as to species, methods of revegetation, and seasons to plant.

Seeding should be done by drilling on the contour whenever practical. Seeding and/or planting should be repeated until satisfactory revegetation is accomplished, as determined by BLM or the SMA. Mulching, fertilizing, tree planting, fencing, or other practices may be required.

For all activities, which alter landforms, disturb vegetation, or require temporary or permanent structures, the operator may be required to comply with visual resource management objectives for the area.

Reclamation and abandonment of pipelines and flowlines may involve replacing fill in the original cuts, reducing and grading cut-and-fill slopes to

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conform to the adjacent terrain, replacement of surface soil material, waterbarring, and revegetating in accordance with normal rehabilitation practices.

Resource Evaluation

All of Florida is considered to be prospective for oil and gas. Thus Florida has been classified into high, moderate, and low areas of potential for oil and gas reserves. These are defined as:

High: Inclusion in an oil and gas play as defined by the USGS national assessment, or, in the absence of a play designation by USGS, is the demonstrated existence of: source rock, thermal maturation, reservoir strata possessing permeability and/or porosity, and traps. Demonstrated existence is defined by physical evidence or documentation in the literature.

Moderate: Geophysical or geological indications that the following may be present: source rock, thermal maturation, reservoir strata possessing permeability and/or porosity, and traps.

Geologic indication is defined by geological inference based on indirect evidence.

Low: Specific indications that one or more of the following may not be present: source rock, thermal maturation, or reservoir strata possessing permeability and/or porosity, and traps.

None: Demonstrated absence of source rock, thermal maturation, and reservoir rock that precludes the occurrence of oil and/or gas. Demonstrated absence is defined by physical evidence or documentation in the literature.

Oil and gas potential is illustrated in Map 3.

Reasonably Foreseeable Development

Assumptions and analysis of the reasonably foreseeable fluid mineral development in the project area are outlined below. These assump-

tions are necessary for a meaningful and reasoned analysis of the cumulative impacts resulting from oil and gas leasing and development. The assumptions are based on a statistical analysis of historic development. It was estimated that 10 wells would be drilled on the FMO and 90 wells on private surface and minerals. Of these 100 wells, 6 percent will be successful. In this analysis, the figure 100 wells was used to estimate the cumulative impacts from oil and gas development. If wells are drilled on the FMO, they will be deep zone tests. They will be drilled within the next 10 years in a high potential area, most likely in the Blackwater State Forest.

The following assumptions were used in this analysis:

The average length of access road per well site would be one-third mile.

The maximum width of the access road would be 30 feet.

The average length of a gathering line per well would be approximately one-third mile to existing road or flowline rights-of-way for six of the wells.

Gathering line rights-of-way widths would be less than 30 feet and would be placed in road rights-of-way when possible.

For well pad construction, disturbance would be an average of three acres.

These figures reflect surface disturbance that would result from the expected development (10 wells on FMO and 90 wells on other mineral ownership) in Florida during the 10 years after approval of the RMP. Actual road and pipeline lengths could be longer with remaining portions on other surface. The following chart displays the estimated area of disturbance in acres from drilling.

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Number of Wells	Area Disturbed from Drilling (Acres)			Total
	Well Pads	Access Roads		
100	300	121.2		421.2

It is assumed that all wells would be drilled within 10 years. Therefore, surface disturbance associated with exploration for full field development would be spread out over the 10-year period. We expect an average of 10 wells per year to be drilled. The total acreage disturbed will be approximately 421 acres. Of this, approximately 10 percent will occur on federal lands, or 42 acres of disturbance.

The producing well sites (approximately 6 percent of the total wells drilled) will be reduced to a maximum area of 10,000 square feet after the well is put in production. The following chart displays the estimated area disturbed from production.

Number of Wells	Area Disturbed from Production (Acres)				Total
	Well Pads	Flowlines	Roads		
6	1.5	7.2	7.2		15.9

The total acreage disturbed from drilling and production after all wells are drilled will be approximately 428 acres. It should be noted that the total amount of disturbances will not occur at the same time and wells will be abandoned and restored during the 10-year planning period.

Stipulations

Stipulations are added provisions that are attached to and made part of the lease and modify standard lease rights or the manner in which operations may be conducted.

Florida Division of Forestry Stipulations

The following stipulations were developed by the FLDF to be applied to oil and gas leases within the Blackwater River State Forest. These (or very similar) stipulations are attached to most of the existing leases within the Blackwater and will be applied to future leases.

1. No surface occupancy shall be permitted within 300 feet of any creek, stream, river, lake, pond, or wetland. This distance may be increased on a case-by-case basis to assure no impact to a water body or its 100-year flood plain.
2. Surface activities are prohibited within red-cockaded woodpecker colony sites. These are generally 10 acres in size.
3. Surface activities are prohibited within all recreation areas, which includes picnic, day use, and camping areas. Oil well sites are prohibited within 250 feet of these areas. This distance may be increased on a case-by-case basis to assure that any of these areas are not adversely impacted.
4. Surface activities are prohibited from hiking trails and horseback riding trails.
5. Surface activities are prohibited within 250 feet of dwellings and developed areas, such as the headquarters site, certain recreation areas, Munson Nursery, and the Seed Orchard. This distance may be increased on a case-by-case basis to assure that any of these areas are not adversely impacted.
6. Surface activities are prohibited within 250 feet of environmentally sensitive areas, unique natural areas, and known areas of historical significance.
7. Surface activities are prohibited within easement and subleased areas granted to utility and telephone companies, or local government bodies.
8. Surface disturbing activities are prohibited on any road located within the forest boundary. If road degradation is caused by the lessee's equipment, the roads will be repaired immediately by the lessee at lessee's expense. If road improvements need to be made by the lessee, they will be made so that they meet FLDF standards.

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9. Surface disturbing activities may be prohibited from areas where land management activities are taking place, or areas with recently established pine regeneration.
10. Surface activities are prohibited in any area where endangered or threatened species exist or where critical habitat for an endangered or threatened species exists, as determined by the FLDF.
11. Lessee shall work in close cooperation and coordination with the FLDF and no activity of any kind shall be undertaken without prior approval from the FLDF.
12. An oil and gas lessee on Blackwater River State Forest must have both state and federal oil and gas leases for a particular area before conducting any surface activities.
13. An embankment three (3) feet in height will be developed around any oil well site during the initial phase of construction to prevent degradation to the surrounding ecosystem. This embankment will be maintained until the well site is abandoned.
14. Any sites disturbed by a lessee, such as clearing a site for drilling, must have a reclamation plan approved by the FLDF before such disturbance occurs. This plan will require erosion control measures and tree planting. If the FLDF determines that reclamation efforts have failed or are inadequate within a period of five years after the reclamation work has been performed, then the lessee will be required to reclaim the site to the satisfaction of the FLDF.
15. If the lessee requests that merchantable pine timber, as determined by the FLDF, be harvested to accommodate any facilities associated with oil and gas production, lessee will compensate the FLDF for the difference between the salvage price and the current market value of such timber. Under no circumstances are trees to be harvested, damaged and/or destroyed without prior authoriza-

tion from the FLDF. If undesignated live trees are harvested, damaged, and/or destroyed as a result of any operation associated with an oil and gas lease, or if lessee requests timber be removed from any area and does not develop that area, lessee will compensate the FLDF double stumpage based on the market value of such trees, as determined by the FLDF. This would not relieve the lessee from paying possible additional punitive damages.

RMP Stipulations

The stipulations listed below shall be applied, as prescribed in the approved RMP, to future oil and gas leases on both split-estate FMO and BLM surface tracts. If the resources protected by the stipulations would be affected by lease of SMA lands, the same stipulation(s), or similar stipulation(s) developed by the SMA, would be applied.

There are three categories of lease stipulations; no surface occupancy, timing limitation, and controlled surface use, as defined below:

No Surface Occupancy (NSO) - Use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values.

Timing Limitation (Seasonal Restriction) - Prohibits surface use during specified time periods to protect identified resource values.

Controlled Surface Use (CSU) - Use and occupancy is allowed, but identified resource values require special constraints on operations.

For each stipulation there are standards for exception, modification, and waiver. An **exception** is a case-by-case exemption from a lease stipulation. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria applies. A **modification** is a fundamental change to the provisions of a lease stipulation, either temporarily or for the term of the lease; a modification may include an exemption from or

alteration to a stipulated requirement and may or may not apply to all other sites within the leasehold to which the restrictive criteria applied. A **waiver** is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

No Surface Occupancy Stipulations

Bald eagle

Stipulation: No surface occupancy will be permitted within a 1,500-foot buffer (primary zone) around bald eagle nests and communal roost sites.

Objective: To avoid impacting nesting eagles and to provide protection for important nesting and foraging habitat.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None

Waiver: This stipulation may be waived if no nest site can be identified on or within 1,500 feet of the leased tract or if the applicant can document that the nest site has not been used by bald eagles for five years.

Choctawhatchee beach mouse and Perdido Key beach mouse

Stipulation: No surface occupancy will be permitted within Choctawhatchee beach mouse or Perdido Key beach mouse federally designated critical habitat.

Objective: To avoid impacts to Choctawhatchee beach mouse and Perdido Key beach mouse.

Exception: None

Modification: None

Waiver: None

Coastal strand

Stipulation: No surface occupancy will be permitted in coastal strand habitats.

Objective: To protect this sensitive plant community and the wildlife and plant species associated with it.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None.

Waiver: This stipulation will be waived if coastal strand is not found on the tract.

Florida scrub habitats and associated sensitive species

Stipulation: No surface occupancy will be permitted in Florida scrub habitats (including sand pine scrub and xeric oak scrub).

Objective: To protect rapidly disappearing scrub habitats. These habitats are endemic to Florida and support several federally and state-listed species, as well as several candidates for federal listing and species of special concern in Florida.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None.

Waiver: This stipulation will be waived if scrub habitats are not found on the lease area.

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Longleaf Pine Preservation Area (Blackwater River State Forest)

Stipulation: No surface occupancy is allowed within the 580-acre Longleaf Pine Preservation Area in the Blackwater River State Forest.

Objective: To reduce impacts to this tract of forest, which is being maintained primarily for education and aesthetic purposes.

Exception: None

Modification: None

Waiver: None

Red-cockaded woodpecker

Stipulation: No surface occupancy within one-half mile of a red-cockaded woodpecker cluster, defined as all cavity trees within a 1,500-foot circle.

Objective: To protect red-cockaded woodpecker nest sites from disturbance and habitat degradation.

Exception: An exception may be granted to allow surface occupancy up to within 200 feet of the cluster if the project is completed without removing trees over 30 years old, and the action will not reduce the available forage below the threshold established by the USFWS. An exception may be granted to allow surface occupancy if the operator agrees to implement a mitigation or compensation program. Proposals for exception must be evaluated in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None.

Waiver: This stipulation may be waived if no active colonies are found on the tract or if off-site compensation has been approved by the USFWS and the state of Florida.

Sandhills

Stipulation: No surface occupancy will be permitted in sandhills.

Objective: To protect this sensitive plant community and the wildlife and plant species associated with it.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None.

Waiver: This stipulation will be waived if sandhills are not found on the tract.

Soil and Water

Stipulation: No surface occupancy will be permitted on the following soil mapping units, as delineated on the referenced maps¹:

Coastal Dune Land and Beach-Tidal Marsh
Plummer-Rutlege-Alluvial Land-Fresh Water
Swamp-Dorovan-Pamlico
Salt Water Marsh-Bayvi-Dirego
Lakeland-Paola-Kureh-St. Lucie-Rimini

Objective: To protect soil or water resources in areas not favorable for construction and installation of facilities associated with oil and gas exploration and development. Limiting characteristics include severe wind erosion and rapid permeability along the Gulf barrier chain, and water table at or near the surface for long periods.

Exception: Use of existing roads which does not require modification or improvement is excepted.

Written requests for exceptions to this stipulation will be considered. An exception will be granted if inspection and analysis shows that the limiting characteristics of the stipulated soil mapping units do not exist on a specific site(s), and conditions

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are found to be favorable for construction and installation of oil and gas facilities. Exceptions may be granted to allow access road construction across these units when no other reasonable alternate road route is available, and the request for exception includes a road construction plan that outlines methods to avoid significant impacts. Development of such a road plan will include coordination with one or more of the following agencies: COE, USFWS, USSCS, or appropriate state agencies.

Modification: None

Waiver: Written requests for a waiver of this stipulation will be considered. A waiver will be granted if inspection and analysis shows that the limiting characteristics of the stipulated soil mapping units do not exist on the lease, and conditions are found to be favorable for construction and installation of oil and gas facilities.

Tropical hardwood hammock

Stipulation: No surface occupancy will be permitted in tropical hardwood hammocks.

Objective: To protect this rare plant community and the sensitive wildlife and plant species associated with it.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None

Waiver: This stipulation will be waived if tropical hardwood hammocks are not found on the tract.

Wading bird rookeries

Stipulation: No surface occupancy is allowed within 375 feet of wading bird rookeries.

Objective: To reduce impacts to nesting wading birds and protect water quality of adjacent foraging areas.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None

Waiver: This stipulation will be waived if wading bird rookeries are found not to exist on or within 375 feet of the tract.

Wetlands, aquatic habitats and associated sensitive species

Stipulation: No surface occupancy will be allowed within an area identified as a wetland or aquatic habitat or within 550 feet of a wetland or aquatic habitat.

The vegetation or hydrology of a wetland area will not be altered in any way or by any means.

Objective: To minimize the loss, destruction, or degradation of wetlands, to preserve and enhance the natural and beneficial value of wetlands areas, to meet the national direction of "no net loss" of wetlands, and to prevent adverse impacts to federally listed plant and animal species and other sensitive species supported by wetland and aquatic habitats.

Exceptions: Use of existing roads which does not require modification or improvement is excepted.

The authorized officer may grant an exception for occupancy within the 550-foot buffer zone (outside of the area identified as a wetland) if it is determined that the proposed use would not cause adverse impacts to federally listed or other sensitive species.

Exceptions may be granted to allow access road construction across these units when no other reasonable alternate road route is available, and

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the request for exception includes a road construction plan that outlines methods to avoid significant impacts. An exception may be granted to allow surface occupancy in the wetland area if measures can be taken to either prevent or offset adverse impacts to the wetland area, through compensating and/or enhancing or restoring wetlands which have been approved by the authorized officer after coordination with one or more of the following agencies: USFWS, USSCS, USACOE, and state agencies.

Modification: None

Waiver: This stipulation may be waived if no wetlands are found on the tract or within 550 feet of the tract.

Wood stork

Stipulation: No surface occupancy will be permitted at any time within 1,500 feet of wood stork nesting colony site (primary zone) or within 1,000 feet of identified roosting.

Objective: To avoid impacts to nesting wood storks and protect water quality of adjacent foraging areas.

Exception: An exception may be granted if an off-site compensation or on-site mitigation plan has been approved by the USFWS and the FGFWFC.

Modification: None

Waiver: This stipulation will may be waived if no evidence of wood stork nesting or roosting is found on or within 1,500 feet of the tract.

Seasonal Restriction Stipulations

Bald eagle

Stipulation: No surface disturbance will be permitted during the nesting period (October 1 through May 15) in the secondary zone, which encompasses the area within a mile of the primary zone around bald eagle nest sites. No trees suitable for nesting or roosting will be removed

from the secondary zone. Typically, these are the largest trees in a stand with open crowns and stout lateral limbs.

Objective: To protect important foraging habitat, promote nest fidelity and maintain habitat integrity around bald eagle nest sites.

Exception: An exception may be granted if the operator agrees to implement a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None

Waiver: This stipulation may be waived if no nest site can be identified or if the applicant can document that the nest has not been active for five years.

Wading bird rookeries

Stipulation: No surface occupancy within 900 feet of wading bird rookeries during the breeding season (February through August).

Objective: To reduce impacts to nesting wading birds and protect water quality of adjacent foraging areas.

Exception: An exception may be granted if the operator agrees to implement a mitigation or compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: None

Waiver: This stipulation will be waived if wading bird rookeries are found not to exist on the tract.

Wood stork

Stipulation: No surface occupancy will be permitted within 1,000 feet of the primary zone around wood stork nesting colony sites during the nesting season.

(Storks require approximately 150 days to complete their nesting cycle. Depending on whether the site is in northern, central or southern Florida, the nesting season will span approximately 150 days between the first of December and the end of August).

Objective: To avoid impacts to nesting wood storks and protect water quality of adjacent foraging areas.

Exception: An exception may be granted if an off-site compensation or on-site mitigation plan has been approved by the USFWS and the FGFWFC.

Modification: None

Waiver: This stipulation will be waived if no evidence of wood stork nesting is found on or within 2,500 feet of the tract.

Controlled Surface Use Stipulations

Florida panther

Stipulation: All new or improved roads longer than one-fourth mile in areas known or expected to support Florida panthers will be gated and closed to all unauthorized vehicular travel for the duration of the exploration and production activities.

Objective: To reduce impacts to the Florida panther from unauthorized use of roads constructed or improved for mineral exploration or development.

Exception: An exception may be granted if adjacent land use or land cover types preclude use of the area by panthers.

Modification: None

Waiver: None

Gopher tortoise, gopher frog, sand skink, mole skink, and other gopher tortoise commensals

Stipulation: In the following habitat types BLM-approved surveys for suitable gopher tortoise and commensal species will be required prior to any surface disturbance:

Coastal Strand
Pinelands
Sandhills
Sand Pine Scrub
Mixed Hardwood Pine Forests
Xeric Oak Scrub

No surface disturbance will be permitted within 50 meters of an active or inactive burrow or within areas of 25 acres or more with tortoise densities higher than 0.8 per acre.

Exception: Surface disturbance may be permitted within 50 meters of a gopher tortoise burrow or within areas with densities higher than 0.8 tortoises per acre, if the project is covered by a relocation and compensation plan developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Modification: Survey requirements may be modified if current tortoise wildlife surveys of the tract meet with BLM's approval.

Waiver: This stipulation will be waived if gopher tortoise habitat is found not to exist on the tract.

Groundwater No. 1

Stipulation: Closed mud systems are required for drilling operations on the following soil mapping units, as delineated on the referenced maps¹:

Lakeland-Eustis-Lakewood
Klej-Leon
Huckabee-Kalmia-Izagora
Chipley-Scranton
Johns-Leaf
Chipley-Albany-Leon
Ardilla-Leefield-Stilson

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Objective: To protect groundwater resources in areas not favorable for construction of reserve pits. Limiting characteristics include excessive seepage and/or high water table.

Exception: Written requests for exceptions to allow reserve pits on specific sites will be considered. An exception will be granted if inspection and analysis shows that the limiting characteristics of the stipulated soil mapping units do not exist on the site(s), and conditions are found to be favorable for construction of a reserve pit.

Modification: None

Waiver: Written requests for a waiver of this stipulation will be considered. A waiver will be granted if inspection and analysis shows that the limiting characteristics of the stipulated soil mapping units do not exist on the lease, and conditions are found to be favorable for construction of reserve pits

Groundwater No. 2

Stipulation: Either a closed mud system or lined reserve pit will be required for drilling operations on the following soil mapping units. The determination will be based on site-specific inspection and analysis. The soil mapping units are delineated on the referenced maps¹:

Lakeland, Ruston, and Norfolk-Sunsweet,
Carnegie, and Cuthbert
Norfolk-Ruston-Savannah
Tifton-Irvington-Lynchburg
Lakeland-Troup
Dothan-Orangeburg
Fuquay-Lucy-Troup
Dothan-Orangeburg-Tifton
Lakeland-Faceville

Objective: To protect groundwater resources. Limiting characteristics may include excessive seepage and/or high water table.

Exception: None

Modification: None

Waiver: None

Groundwater No. 3

Stipulation: Lined reserve pits are required as a minimum standard for drilling operations on the following soil mapping units, as delineated on the referenced maps¹:

Red Bay-Blakely
Tifton-Carnegie-Faceville
Troup-Orangeburg
Red Bay-Lucy

Objective: To protect groundwater resources. Limiting characteristics may include moderate seepage.

Exception: None

Modification: None

Waiver: None

Lease Notices

Notices are attached to leases to inform the lessee of restrictions that may apply because of law, regulations, standard lease terms, or onshore oil and gas orders. Lease notices alone do not involve new restrictions or requirements, but may assist the lessee in submitting acceptable surface use plans.

The following notice will be applied to all new leases within areas identified as habitat for plant species which are federally listed or candidates for federal listing, and/or are listed by the state of Florida as endangered, threatened or a species of concern. The species and applicable areas will include those identified in Appendix I.

Lease Notice
Protection of Sensitive Plant Species

The leased lands may contain habitat suitable for the occurrence of the following species which are federally listed or candidates for federal listing, and/or are listed by the state of Florida as endangered, threatened, or a species of concern:

(Species listed include those potentially occurring in the lease area as identified in Appendix I)

All viable habitat will be identified during environmental review of the proposed surface use

program. If field examination indicates that habitat of one or more of these species is present, BLM will determine whether or not the species would be affected by the proposed activity. If the species would be affected, conference and/or consultation with FGFWFC and the USFWS would be undertaken as appropriate in accordance with BLM Manual 6840. This may require additional time to process the lessee's/operator's proposal, and may result in restrictions to the proposed operations, including denial of surface disturbance in habitat areas or requirements to compensate for habitat loss.

¹ Names of Source Maps:

Florida Ecological Atlas, Map C1, Bay Minette, Soil and Landforms, produced by U.S. Fish and Wildlife Service and Minerals Management Service, 1984.

Florida Ecological Atlas, Map C2, Pensacola, Soil and Landforms, produced by U.S. Fish and Wildlife Service and Minerals Management Service, 1984.

Florida Ecological Atlas, Map C3, Crestview, Soil and Landforms, produced by U.S. Fish and Wildlife Service and Minerals Management Service, 1984.

Florida Ecological Atlas, Map C4, Fort Walton Beach, Soil and Landforms, produced by U.S. Fish and Wildlife Service and Minerals Management Service, 1984.

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Appendix D

Recreation and Visual Resources

Recreation Opportunity Spectrum Class Descriptions

Recreation opportunities can be expressed in terms of three main components: activities, settings, and experiences. For management and conceptual convenience, possible mixes of these components have been arranged along a spectrum, or continuum. This Recreation Opportunity Spectrum (ROS) provides a framework for stratifying and defining classes of outdoor recreation opportunity environments. Because of the small size of BLM-administered lands, privately owned lands adjacent to BLM-administered lands were considered when applying the ROS classification system. However, these classes apply only to the public domain lands within Florida. These classifications are not meant to apply to other land ownership in the state.

Primitive

Activity - Camping, hiking, enjoying scenery or natural features, photography, hunting (big game, small game, upland birds, waterfowl), swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (non-motorized craft).

Setting - The area is characterized by an essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Only facilities essential for resource protection are used. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts between groups. Motorized use within the area is not permitted.

Experience Opportunity - There are opportunities for isolation from the sights and sounds of man, to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills.

Semi-Primitive Non-Motorized

Activity - Camping, hiking, enjoying scenery or natural features, photography, hunting (big game, small game, upland birds, waterfowl), swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (non-motorized craft).

Setting - The area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is evidence of other area users. On-site controls and restrictions may be present, but are subtle. Facilities are provided only for the protection of resource values and the safety of users. Spacing of groups may be formalized to disperse use and limit contacts between groups. Motorized use is not permitted.

Experience Opportunity - There are some opportunities for isolation from the sights and sounds of man, but this is not as important for this classification as it is for primitive opportunities. Opportunities are available to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.

Rural

Activity - Camping, hiking, enjoying scenery or natural features, photography, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (motorized craft), power boating, picnicking, rock collecting, wood gathering, auto

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RECREATION AND VISUAL RESOURCES

touring, water skiing and other water sports, interpretive services use rustic resorts and organized camps, competitive games, spectator sports, bicycling, jogging, outdoor concerts, and modern resorts.

Setting - The area is characterized by a substantially modified natural environment. Resource modification and utilization practices are obvious. Sights and sounds of man are readily evident, and the concentration of users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for specific activities. Developed sites, roads, and trails are designed for moderate to high use. Facilities for intensive motorized use are available.

Experience Opportunity - Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of the sites and opportunities. These factors are generally more important than the natural setting. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant, except in specific activities involving challenge and risk.

Urban

Activity - Camping, hiking, enjoying scenery or natural features, nature study, photography, swimming, diving (skin and scuba), fishing, canoeing, sailing, and river running (non-motorized craft), power boating, picnicking, rock collecting, wood gathering, auto touring, water skiing and other water sports, interpretive services use rustic resorts and organized camps, competitive games, spectator sports, bicycling, jogging, outdoor concerts, and modern resorts.

Setting - The area is characterized by a substantially modified natural environment. Resource modification and utilization practices are obvious. Sights and sounds of man are readily evident, and the concentration of users is often moderate to high. A considerable number of facilities are designed for use by a large number of people.

Facilities are often provided for specific activities. Developed sites, roads, and trails are designed for moderate to high use. Facilities for intensive motorized use are available.

Experience Opportunity - Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. Experiences of the natural environment and the use of outdoor skills are largely unimportant.

Residential Beach Community

Activity - Generally all activities associated with a coastal beach would be permitted. This may include but is not limited to recreational fishing (both land and water based), ocean viewing, shell collecting, swimming, and sunbathing. Camping on the beach may be restricted by state or local statutes. Motorized use of the beach area or within the beach community may be permitted, not allowed, or restricted depending on state or local statutes.

Setting - A residential beach community is characterized by a substantially modified natural environment. The sites and sounds of man are readily evident and the concentration of users can be moderate to high. Roads in a beach community are generally designed for moderate to high use. Residential structures are generally designed for safety against coastal storms and providing a seaward view.

Experience Opportunity - In a residential beach community, the opportunity for interaction between users is generally considered to be moderate to high. The degree of interaction would vary by time of day of use, weather conditions, or season of use. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant to residents/users of residential beach communities.

Visual Resources Management (VRM)

The visual resource inventory process contained in BLM Handbook H-8410-1 provides BLM managers with guidance for determining visual values. The inventory consists of scenic quality evaluation, sensitivity level analysis, and delineation of distance zones. Based on these three factors BLM-administered lands are placed into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resource. Classes I and II being the most valued, Class III representing a moderate value, and Class IV being the least value. Management objectives have been assigned to each Class. An area may be inventoried as VRM Class III but the decision may be made to manage it as a VRM Class IV or vice versa. Cultural modifications may detract from the scenery, or complement, or improve the overall scenic quality of an area. Cultural modifications in the landform/water and vegetation values and addition of structures will be considered when examining proposed resource management actions.

The VRM inventory and management classes were designed to address larger tracts of land than those which comprise the public domain lands in Florida. Visual Resource Management objectives as discussed in the alternatives will pertain only to the level and type of disturbance to visual resources, and only to the specific tract and not to the general setting in which the tract is located.

The following VRM class definitions from BLM Handbook H-8410-1 have been amended for purposes of developing and implementing the Florida RMP. Amendments incorporate the visual resource values provided by existing cultural features significant to the character of the Florida landscape.

VRM Class I Objective

The objective of this class is to preserve the existing natural and cultural character of the

landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention away from the existing landscape character.

VRM Class II Objective

The objective of this class is to retain the existing natural and cultural character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural and/or cultural features of the characteristic landscape.

VRM Class III Objective

The objective of this class is to partially retain the existing natural and cultural character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural and/or cultural features of the characteristic landscape.

VRM Class IV Objective

The objective of this class is to provide for management activities which require major modification of the existing character of the natural and cultural landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the casual observer's attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating of the basic elements.

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Appendix E

Soils

Physiographic Regions of Florida

Physiographic regions in Florida are described as follows (FLDNR 1989):

The **Western Highlands Region** includes most of the northern portion of the Florida panhandle between the Perdido and Apalachicola rivers, and is north of the Coastal Lowlands physiographic region. This area is a southward-sloping plateau, hilly, and includes the highest measured elevation in the state, 345 feet.

The **Marianna Lowlands Region** covers the area west of the Apalachicola River and is a low, rolling hill and sinkhole region. It is bordered by the Western Highlands physiographic region on the western and southern border and the Tallahassee Hills physiographic region on the east.

The **Tallahassee Hills Region** is north of the Coastal Lowlands and stretches from the Apalachicola River to the northern Withlacoochee River. This area is characterized by long, gentle slopes with rounded summits.

The **Central Highlands Region** extends from the Tallahassee hills physiographic region and the Okefenokee Swamp in the north to just north of Lake Okeechobee. This area ranges in altitude from 200 feet to less than 40 feet above sea level.

The **Coastal Lowlands Region** forms the entire Florida coastline, including the Florida Keys. This area consists of a series of broad, nearly level marine terraces and extends several miles inland.

Soils in the High Mineral Potential Areas

Soils in high potential oil and gas, phosphate, and limestone areas have been classified and mapped according to specific soil units and soil series. Soil units consist of areas that have a distinctive pattern of soils, relief, and drainage. Each unit consists of one or more major soil series and some minor soils or landforms. While the characteristics of the individual soils within the unit may vary, the overall characteristics of the unit is relatively uniform.

Oil and Gas

The area of high potential oil and gas development is located in the Western Highlands and Coastal Lowlands physiographic regions and occurs in parts of Escambia, Santa Rosa, and Okaloosa Counties (see Map 3). Soils in the western highlands region consist primarily of unconsolidated sands, silts, and clays. Soils in the Coastal Lowlands region consist of coarse-textured sandy soils associated with coastal beaches and dunes, deep loamy sandy soils to sandy clay loams underlain by loamy sand or organic soils associated with tidal marsh and swamp areas, and deep sandy loamy soils associated with upland plant communities or bottomland hardwoods.

The general soil units and acreage of FMO on each unit in the western portion of the panhandle is shown in Table E-1. Table E-2 describes the characteristics of each soil unit, its suitability for oil and gas operations, and stipulations (as required by the approved RMP) to protect surface and ground water quality.

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Phosphate and Limestone

The area of high potential phosphate development is located in the Coastal Lowlands and Central Highlands physiographic regions and occurs in parts of Polk, Manatee, Hardee, Desoto, and Hillsborough Counties (see Map 4).

The area of high potential limestone development is located in the Marianna Lowlands and Central Highlands physiographic regions and occurs in parts of Jackson, Citrus, Hernando, Sumter, and Pasco Counties (see Map 5).

Tables E-3 and E-4 describe the soil units, counties where they occur, soil unit characteristics, and selected soil properties for making broad comparisons between soil units.

The properties shown would neither hinder nor promote mining of phosphate or limestone in a selected area. An exception to this would be if a soil unit or specific soil type is identified as a wetland soil.

Surface Tracts

Table E-5 describes the soil units found on each of the surface tracts. As with phosphate and limestone mining, the soil properties shown are for making broad comparisons between soil units. The soils themselves, for the most part, would not affect a management decision made on these tracts. However, the vegetative community (habitat) supported by a soil unit could affect the decision process. For this reason ratings for agriculture have been added to the table.

Table E-1. General Soil Units for High Oil and Gas Potential Areas in Escambia, Santa Rosa, and Okaloosa Counties.

General Soil Unit	Acreage on Federal Minerals
Lakeland-Eustis-Lakewood	7
Lakeland, Ruston, and Norfolk-Sunsweet, Carnegie, and Cuthbert	0
Red Bay-Blakely	0
Tifton-Carnegie-Faceville	0
Norfolk-Ruston-Savannah	0
Tifton-Irvington-Lynchburg	0
Klej-Leon	0
Huckabee-Kalmia-Izagora	0
Coastal Dune Land and Beach-Tidal Marsh	133
Plummer-Rutledge-Alluvial Land-Fresh Water Swamp-Dorovan-Pamlico	27,125
Lakeland-Paola-Kureb-St. Lucie-Rimini	232
Lakeland-Troup	39,053
Troup-Orangeburg	4,993
Dothan-Orangeburg	53,853
Red Bay-Lucy	0
Chipley-Scranton	18,346
Johns-Leaf	94
Salt Water Marsh-Bayvi-Dirego	13
Fuquay-Lucy-Troup	13,427
Dothan-Orangeburg-Tifton	8,946
Lakeland-Faceville	1,009
Chipley-Albany-Leon	0
Ardilla-Leefield-Stilson	16,871
Total	184,102

Table E-2. Suitability of General Soil Units in Escambia, Santa Rosa and Okaloosa Counties for Oil and Gas Operations.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Lakeland-Eutis-Lakewood	Nearly level to steep soils on uplands; very sandy throughout; excessively drained; very rapid permeability; low organic matter and fertility.	Lakeland	Fair to good; slope	Poor; excessive seepage	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Eutis	Fair to good; slope	Poor; excessive seepage	
		Lakewood	Fair to good; slope	Poor; excessive seepage	
Lakeland, Ruston and Norfolk-Sunsweet, Carnegie and Cuthbert	Undifferentiated upland soils; ranges from sandy throughout to loamy soils with loamy or clayey subsoil; mostly on steeper slopes along streams and drainageways; surface runoff is high.	Lakeland	Fair to good; proximity to drainageways; slope	Poor; proximity to drainageways; excessive seepage; slope	Controlled Surface Use. Lined reserve pit or closed system may be required. Determination made on site specific basis.
		Ruston	Fair to good; proximity to drainageways; slope	Fair to good; proximity to drainageways; moderate seepage; slope	
		Norfolk	Fair; wetness; proximity to drainageways; slope	Poor; proximity to drainageways; seasonal high water table (Jan-March); slope	
		Sunsweet	Fair to good; proximity to drainageways; slope	Fair to good; proximity to drainageways; slope	
		Carnegie	Fair to good; proximity to drainageways; slope	Fair to good; proximity to drainageways; slope	
		Cuthbert	Fair to good; proximity to drainageways; slope	Fair to good; proximity to drainageways; slope	
Red Bay Blakely	Nearly level to gently sloping soils on uplands; well drained loamy soils with loamy subsoil; moderate permeability.	Red Bay	Good	Fair to good; moderate seepage	Controlled Surface Use. Reserve pits must be lined to prevent seepage of drilling fluids.
		Blakely	Good	Fair to good; moderate seepage	

Table E-2. Continued.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Tifton-Carnegie-Faceville	Level to gently sloping soils on uplands; well drained sandy loam with sandy clay or sandy clay loam subsoil; rapid permeability in surface soil and moderate in subsoil.	Tifton	Good	Fair to good; moderate seepage	Controlled Surface Use. Reserve pits must be lined to prevent seepage of drilling fluids.
		Carnegie	Good	Fair to good; moderate seepage	
		Faceville	Good	Fair to good; moderate seepage	
Norfolk-Ruston-Savannah	Nearly level to gently sloping soils on uplands; well drained or moderately well drained; sandy loam soils with sandy clay loam subsoil; moderate to slow permeability.	Norfolk	Fair; wetness	Poor; seasonal high water table (Jan-March)	Controlled Surface Use. Reserve pits must be lined to prevent seepage of drilling fluids.
		Ruston	Good	Fair to good; moderate seepage	
		Savannah	Good	Fair to good; moderate seepage	
Tifton-Irvington-Lynchburg	Nearly level to gently sloping soils on uplands; well drained to somewhat poorly drained; sandy loam soils with sandy clay loam subsoil moderately slow permeability in subsoil.	Tifton	Good	Fair to good; moderate seepage	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Irvington	Poor to fair; slow drainage, high water table	Poor; slow drainage, high water table	
		Lynchburg	Poor to fair; wetness	Poor; seasonal high water table (Nov-April)	

Table E-2. Continued.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Klej-Leon:	Nearly level; somewhat poorly drained sandy soils; sandy throughout or with weakly cemented sandy subsoils; rapid permeability; high water table.	Klej	Poor to fair; wetness	Poor; high water table	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Leon	Poor to fair; wetness	Poor; seepage; high seasonal water table (June-Feb)	
Huckabee-Kalmia-Izagora	Nearly level; well drained soils along stream terraces; sandy throughout and moderately well drained; loamy or clayey subsoil; moderate to rapid permeability.	Huckabee	Fair to good; proximity to drainageways	Poor; excessive seepage	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Kalmia	Fair to good; proximity to drainageways	Poor; excessive seepage	
		Izagora	Fair to good; proximity to drainageways	Poor; high water table	
Coastal Dune Land and Beach-Tidal Marsh:	Two undifferentiated units that occur as narrow strips adjacent to the coast. Nearly level; sandy soil and poorly drained soils subject to frequent flooding by tidal waters and nearly level to strongly sloping; sandy soils not subject to flooding by tidal waters.	Coastal Dune Land and Beach	Poor; severe erosion	Poor; rapid permeability; high water table	No Surface Occupancy
		Tidal Marsh	Poor; inundated by tidal water	Poor; inundated by tidal water	

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Table E-2. Continued.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Plummer-Rutlege- Alluvial Land-Fresh Water Swamp- Dorovan-Pamlico	Nearly level; poorly drained soils with a thick loamy sand surface layer overlaying sand or loamy sand subsoil and very poorly drained soils that are composed of muck or fine sand with muck or sandy loam subsoil; the water table is at or near surface for long periods.	Plummer	Poor; water table at or near surface	Poor; water table at or near surface; seepage	No Surface Occupancy
		Rutlege	Poor; water table at or near surface (Dec-May)	Poor; water table at or near surface (Dec-May); seepage	
		Alluvial Land-Fresh Water Swamp	Poor; water table at or near surface	Poor; water table at or near surface	
		Dorovan	Poor; water at or near surface	Poor; water at or near surface	
		Pamlico	Poor; water at or near surface	Poor; water at or near surface	
Lakeland-Paola-Kureb- St. Lucie-Rimini	Nearly level to steep; excessively drained soils; sandy throughout; rapid permeability. This unit is associated with the Sand Pine Scrub ecological community and includes soils along the Gulf barrier islands	Lakeland	Fair to good; slope	Poor; excessive seepage	No Surface Occupancy
		Kureb	Fair; erosion, slope	Poor; excessive seepage	
		St.-Lucie	Fair; erosion, slope	Poor; excessive seepage	
Lakeland-Troup	Nearly level to strongly sloping on ridges and hillsides; excessively drained and sandy throughout; rapid permeability; and well drained soils with at least 40 inches of sand over loamy subsoil; rapid permeability in surface soil and moderate in subsoil.	Lakeland	Fair to good; slope	Poor; excessive seepage	Controlled Surface Use. Lined reserve pit or closed system may be required. Determination made on site specific basis.
		Troup	Fair to good; slope	Fair to good; moderate seepage	

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Table E-2. Continued.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Troup-Orangeburg	Sloping to strongly sloping on ridges and hill sides; well drained; sandy loam soils with sandy clay loamy subsoil; permeability moderately rapid to rapid in surface and subsurface and moderate in subsoil.	Troup	Fair to good; slope	Fair to good; moderate seepage	Controlled Surface Use. Reserve pits must be lined to prevent seepage of drilling fluids.
		Orangeburg	Fair to good; slope	Fair to good; moderate seepage	
Dothan-Orangeburg	Nearly level to sloping; well drained; sandy loam soils with sandy clay and sandy clay loam subsoil; permeability moderate to moderately rapid in surface and subsurface and moderate to moderately slow in subsoil. Dothan soils have a loamy surface layer of less than 20 inches and perched water table.	Dothan	Good	Poor; seasonal high water table (Jan-April)	Controlled Surface Use. Lined reserve pit or closed system may be required. Determination made on site specific basis.
		Orangeburg	Fair to good; slope	Fair to good; moderate seepage	
Red Bay-Lucy	Nearly level to sloping; well drained; loamy and sandy soils with a red or dark red sandy loam and sandy clay loam subsoil; permeability moderate to rapid in surface and subsurface and moderate in subsoil.	Red Bay	Good	Fair to good; moderate seepage	Controlled Surface Use. Reserve pits must be lined to prevent seepage of drilling fluids.
		Lucy	Good	Fair to good; moderate seepage	
Chipley-Scranton	Nearly level to gently sloping; somewhat poorly drained sandy soils; permeability moderate to rapid; high water table.	Chipley	Poor to fair; wetness	Poor; excessive seepage; high seasonal water table (Dec-April)	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Scranton	Poor to fair; wetness	Poor; moderate seepage, high water table	

Table E-2. Continued.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Johns-Leaf	Nearly level; somewhat poorly to poorly drained; sandy loam soils with loamy subsoil on river terraces; permeability moderately rapid to rapid; high seasonal water table.	Johns	Poor to fair; wetness; proximity to drainageways	Poor; proximity to drainageways; high seasonal water table (Nov-April); excessive seepage	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
Salt Water Marsh- Bayvi-Dirego	Nearly level on tidal marshes; very poorly drained soils subject to frequent flooding by tidal waters; some are sandy to a depth of 80 inches or more; and others are organic to a depth of 14 to 50 inches and are sandy below.	Salt Water Marsh	Poor; inundated by tidal water	Poor; inundated by tidal water; rapid permeability	No Surface Occupancy
		Bayvi	Poor; inundated daily by tidal water	Poor; inundated by tidal water; rapid permeability	
		Dirego	Poor; water table at or above surface; rapid permeability	Poor; water table at or above surface; rapid permeability	
Fuquay-Lucy-Troup	Nearly level to sloping on ridges and side slopes; well drained; thick sand and loamy sand surface soils with sandy clay loam subsoil; permeability rapid in surface and moderate to slow in subsoil.	Fuquay	Good	Poor; high seasonal water table (Jan-March); seepage	Controlled Surface Use. Lined reserve pit or closed system may be required. Determination made on site specific basis.
		Lucy	Good	Fair; moderate seepage	
		Troup	Good	Fair; moderate seepage	
Dothan-Orangeburg-Tifton	Nearly level to strongly sloping; well drained; sandy loam surface soils with sandy clay loam subsoil; permeability moderate to moderately rapid in surface soil and moderate to moderately slow in subsoil.	Dothan	Good	Poor; high seasonal water table (Jan-April)	Controlled Surface Use. Lined reserve pit or closed system may be required. Determination made on site specific basis.
		Orangeburg	Good	Fair to good; moderate seepage	
		Tifton	Good	Fair to good; moderate seepage	

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Table E-2. Concluded.

General Soil Units	Characteristics	Soil Series or Landform	Well Pad, Road and Production Facility Construction	Reserve Pit Construction	Stipulation
Lakeland-Faceville	Nearly level to steep; excessively drained soils; sandy throughout; and well drained; sandy loam soils with sandy clay subsoil.	Lakeland	Fair to good; slope	Poor; excessive seepage	Controlled Surface Use. Lined reserve pit or closed system may be required. Determination made on site specific basis.
		Faceville	Fair to good; slope	Fair to good; seepage	
ChIPLEY-Albany-Leon	Nearly level to gently sloping; poorly drained and somewhat poorly drained; sandy throughout; permeability rapid in surface soil and moderate to rapid in subsoil; and poorly drained; sandy soils with weakly cemented sandy subsoil; high water table.	ChIPLEY	Poor to fair; wetness	Poor; excessive seepage; high seasonal water table (Dec-April)	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Albany	Poor to fair; wetness	Poor; seepage; high seasonal water table (Dec-March)	
		Leon	Poor to fair; wetness	Poor; seepage; high seasonal water table (June-Feb)	
Ardilla-Leefield-Stilson	Nearly level to gently sloping soils on low uplands or high flatwoods; somewhat poorly drained and moderately well drained loamy sand with loamy sand and sandy clay loam subsoil; permeability moderately rapid to rapid in surface soil and moderate to moderately slow in subsoil; seasonal high water table.	Ardilla	Poor to fair; wetness	Poor; high seasonal water table; seepage in surface and subsurface layers	Controlled Surface Use. Closed mud system (no reserve pit) required on this unit.
		Leefield	Poor to fair; wetness	Poor; high seasonal water table (Dec-March); seepage in surface and subsurface layers	
		Stilson	Poor to fair; wetness	Poor; high seasonal water table (Dec-April); seepage in surface and subsurface layers	

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Table E-3. Soil Characteristics for High Phosphate Potential areas in Polk, Manatee, Hardee, Desoto and Hillsborough Counties.

General Soil Units (occurrence by county)	Characteristics	Erosion Potential(1)	Flooding Hazard(2)	Hydrologic Potential(3)	Road Construction Potential(4)
Candler-Apopka-Astatula (Polk County)	Level to strongly sloping, excessively drained thick sandy soils with thin loamy sandy bands in the subsoil, or a loamy subsoil. Some are sandy throughout.	Low to Moderate	None	Low run-off potential.	Good
Mykka-Immokalee-Waveland (Polk, Hardee & Hillsborough Counties)	Level, poorly drained sandy soils with a dark sandy subsoil and cemented sandy subsoil	Low to Moderate	None	Low run-off potential.	Poor
Wabasso-Felda-Pompano (Polk, Desoto & Manatee Counties)	Poorly drained sandy soils, dark sandy subsoil underlain by loamy subsoil.	Low to Moderate	None	Low run-off potential.	Poor

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(1) Erosion Potential - Is an estimate of the soil-loss resulting from rainfall erosion of cropland at a slope of 9 percent and the permissible soil loss that may occur and still permit a high level of crop productivity.

(2) Flooding Hazard - Flooding is defined as temporary covering of the soil surface by water from any source, such as streams overflowing their banks runoff from adjacent or surrounding slopes, inflow from high tides, or combinations of these. Flooding hazard is expressed by one of three general flood frequency classes: None--No reasonable possibility of flooding, Rare--Flooding unlikely but possible under unusual weather conditions, Common--Flooding is likely under usual weather conditions.

(3) Hydrologic Potential - Soils are grouped into four hydrologic soil groups. The groups are mostly used in watershed planning to estimate runoff from rainfall. The four groups are: Low runoff Potential - soils have a high infiltration rate and a high rate of water transmission; even when thoroughly wetted. Moderately low Runoff Potential - Soils have moderate infiltration rate and moderate rate water transmission; even when thoroughly wetted. Moderately high runoff Potential - Soils have slow infiltration rate and slow rate water transmission; even when thoroughly wetted. High runoff Potential - Soils have a very slow infiltration rate and a very slow rate of water transmission; even when thoroughly wetted.

(4) Road Construction Potential - This provides an indication of the soil capability for use as road fill. The rating is given for the whole soil, from the surface to a depth of five feet. It is assumed that soil horizons will be mixed in loading dumping and spreading. A rating of good means the soil has favorable properties. A rating of fair means the soil has one or more unfavorable properties and special design and or extra maintenance may be required. A rating of poor means that the soil is not suited for road construction.

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Table E-4. Soil Characteristics for High Limestone Potential areas in Jackson, Citrus, Hernando, Sumter, and Pasco Counties.

General Soil Units and occurrence by county	Characteristics	Erosion Potential(1)	Flooding Hazard(2)	Hydrologic Potential (3)	Road Construction Potential(4)
Lakeland-Troup-Alpin (Jackson County)	Nearly level to sloping excessively drained soils, sandy throughout and well-drained soils with a very thick sandy surface layer over a loamy subsoil.	Low to Moderate	None	Low run-off potential.	Good
Arredondo-Kendrick-Millhopper (Sumter, Hernando & Citrus Co's)	Nearly level to sloping well and moderately well-drained sandy soils with a loamy subsoil at 20 to 80 inches.	Low to Moderate	None	Low run-off potential.	Good
Candler-Apopka-Astatula (Citrus County)	Level to strongly sloping, excessively drained thick sandy soils with thin loamy sandy bands in the subsoil, or a loamy subsoil. Some are sandy throughout.	Low to Moderate	None	Low run-off potential.	Good
Mykka-Immokalee-Waveland (Citrus County)	Level, poorly drained sandy soils with a dark sandy subsoil and cemented sandy subsoil	Low to Moderate	None	Low to moderate run-off potential.	Poor
Pomona-Wauchula-Placid (Citrus County)	Nearly level poorly drained sandy soils, some with a dark sandy subsoil underlain by a loamy subsoil and very poorly drained thick sandy soils with a thick dark surface layer	Low	None	Moderate to High run-off potential.	Poor

(1) Erosion Potential - Is an estimate of the soil-loss resulting from rainfall erosion of cropland at a slope of 9 percent and the permissible soil loss that may occur and still permit a high level of crop productivity.

(2) Flooding Hazard - Flooding is defined as temporary covering of the soil surface by water from any source, such as streams overflowing their banks runoff from adjacent or surrounding slopes, inflow from high tides, or combinations of these. Flooding hazard is expressed by one of three general flood frequency classes: None--No reasonable possibility of flooding, Rare--Flooding unlikely but possible under unusual weather conditions, Common--Flooding is likely under usual weather conditions.

(3) Hydrologic Potential - Soils are grouped into four hydrologic soil groups. The groups are mostly used in watershed planning to estimate runoff from rainfall. The four groups are: Low runoff Potential - soils have a high infiltration rate and a high rate of water transmission; even when thoroughly wetted. Moderately low Runoff Potential - Soils have moderate infiltration rate and moderate rate water transmission; even when thoroughly wetted. Moderately high runoff Potential - Soils have slow infiltration rate and slow rate water transmission; even when thoroughly wetted. High runoff Potential - Soils have a very slow infiltration rate and a very slow rate of water transmission; even when thoroughly wetted.

(4) Road Construction Potential - This provides an indication of the soil capability for use as road fill. The rating is given for the whole soil, from the surface to a depth of five feet. It is assumed that soil horizons will be mixed in loading dumping and spreading. A rating of good means the soil has favorable properties. A rating of fair means the soil has one or more unfavorable properties and special design and or extra maintenance may be required. A rating of poor means that the soil is not suited for road construction.

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Table E-5. Soil Units, Characteristics and Potential found on Surface Tracts.

General Soil Units (occurrence by surface tract)	Characteristics	Erosion Potential (1)	Flooding Hazard (2)	Hydrologic Potential (3)	Road Construction Potential (4)	Cropland/ Pasture (5)	Woodland (6)
Coastal Beach and Dunes (Walton County tracts, and Cape San Blas)	Nearly level to gently sloping, excessively drained soils that are sandy throughout	Moderate to Low.	Very Rare to None.	Low run-off potential.	Slight to Severe Limitations.	VIIIw/s	Not Suitable.
Tidal marsh and Tidal swamp (Lathrop Bayou)	Level very poorly drained coastal marshes and swamps consisting of variable-textured mineral and organic materials subject to frequent tidal flooding.	Moderate to Low.	Common.	High run-off potential.	Severe Limitations	VIIIw	Not suitable.
Plummer-Rutledge (Lathrop Bayou and Cape San Blas)	Nearly level poorly drained soils with a thick sandy surface layer overlying a loamy subsoil and very poorly drained soils that are sandy throughout.	Moderate to Low.	Rare/None.	Moderate/High run-off potential.	Severe Limitations	IVw VIw	2w
Oldsmar-immokalee- Malabar (Peace River)	Nearly Level, poorly drained sandy soils/dark sandy subsoil underlain by loamy subsoil (40 to 80 inches)	Moderate to Low.	None.	Moderate/High run-off potential.	Severe Limitations.	IVw	3/4w
Rock Outcrop-Tidal Marsh (Sugarloaf)	Nearly level exposed limestone rock some with a very thin soil material overlying limestone rock and adjacent tidal marshes subject to frequent flooding by tidal water. The parcel would mostly fall within the Rock Outcrop soil association.	Moderate to Low.	Common.	High run-off potential.	Severe Limitations.	VIIIw/s	Not suitable
Paola-St. Lucie- Daytona (Jupiter Inlet)	Nearly level to sloping excessively drained thick sandy soils and moderately well-drained sandy soils with a dark sandy subsoil.	Moderate to Low.	None.	Low run-off potential.	Slight Limitations.	VIIs VIIIs	4/5s

(1) Erosion Potential - Is an estimate of the soil-loss resulting from rainfall erosion of cropland at a slope of 9 percent and the permissible soil loss that may occur and still permit a high level of crop productivity.

(2) Flooding Hazard - Flooding is defined as temporary covering of the soil surface by water from any source, such as streams overflowing their banks runoff from adjacent or surrounding slopes, inflow from high tides, or combinations of these. Flooding hazard is expressed by one of three general flood frequency classes: None--No reasonable possibility of flooding, Rare--Flooding unlikely but possible under unusual weather conditions, Common--Flooding is likely under usual weather conditions.

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Table E-5. Concluded.

(3) Hydrologic Potential - Soils are grouped into four hydrologic soil groups. The groups are mostly used in watershed planning to estimate runoff from rainfall. The four groups are: Low runoff Potential - soils have a high infiltration rate and a high rate of water transmission; even when thoroughly wetted. Moderately low Runoff Potential - Soils have moderate infiltration rate and moderate rate water transmission; even when thoroughly wetted. Moderately high runoff Potential - Soils have slow infiltration rate and slow rate water transmission; even when thoroughly wetted. High runoff Potential - Soils have a very slow infiltration rate and a very slow rate of water transmission; even when thoroughly wetted.

(4) Road Construction Potential - This provides an indication of the soil capability for use as road fill. The rating is given for the whole soil, from the surface to a depth of five feet. It is assumed that soil horizons will be mixed in loading dumping and spreading. A rating of good means the soil has favorable properties. A rating of fair means the soil has one or more unfavorable properties and special design and or extra maintenance may be required. A rating of poor means that the soil is not suited for road construction.

(5) Capability Grouping for Cropland and Pasture - The capability grouping shows, in a general way, the suitability of soils for most kinds of field crops and improved pasture. The capability classes indicate progressively greater limitations and narrower choices for practical uses and are defined as follows: Class I - Few limitations restricting use; Class II - Moderate limitations that reduce the choice of plants, or that require moderate conservation practices; Class III - Severe limitations that reduce the choice of plants, require special conservation practices; Class IV - Very severe limitations that reduce the choice of plants, require very careful management or both; Class V - not likely to erode, but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife; Class VI - Have severe limitations, that make them unsuited to cultivation and limit their use largely to pasture, range, woodland, or wildlife; Class VII - Have very severe limitations, that make them unsuited to cultivation and that restrict to pasture, range, woodland, or wildlife; Class VIII - Soils and landforms have limitations that preclude their use commercial plants and restrict their use to recreation, wildlife, water supply, or to aesthetic purposes. The subclasses are indicated by a small letter: w - water limitation; e - risk of erosion s - soil is shallow/droughty.

(6) Woodland Suitability Grouping - A woodland suitability symbol is given for each soil that has potential for commercial production: 1 - very high productivity; 2 - high; 3 - moderately high; 4 - moderate; and 5 - low; Not suitable means that the soil unit can not support a commercial woodland. The letter if present indicates the major kind of soil limitation: x - stoniness or rockiness; w - excessive water; t - toxic substances in the soil; d - restricted root depth; c - clay in upper part of soil; s - sandy texture.

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Appendix F

Solid Minerals

Introduction

This appendix is intended to aid in understanding the federal solid mineral management process as it applies to the planning area. In addition, the methodologies used to evaluate resource potential are explained, typical mining practices are discussed, and reasonably foreseeable development and proposed constraints on mining activity are presented.

Based on the laws which authorize exploration and development of federal minerals, minerals are classified as "leasable", "locatable", and "salable" as defined below.

Leasable minerals are those federal mineral rights available for disposal and development under the authority of the Mineral Leasing Act of 1920, as amended. Included are federal minerals on acquired lands as provided by the Mineral Leasing Act for Acquired Lands of 1947, as amended. Solid leasable minerals include coal and phosphate.

Locatable minerals are those federal minerals available for disposal and development under the authority of the Mining Law of 1872, (as amended). Included are minerals on public domain such as the metallic minerals (e.g., gold and silver) and other minerals of special value on public domain (e.g., some clays and high quality limestone).

Salable minerals are those federal minerals available for disposal and development under the authority of the Material Sale Act of 1947, as amended. Included are common sand, stone, gravel, and clay.

Early in the planning process, as part of developing planning criteria (See Chapter 1), it was decided to base decisions pertaining to management of locatable, solid leasable, and salable minerals on analysis of minerals with known development potential on FMO. At the outset these minerals included phosphate, limestone, heavy mineral sands (titanium), sand, gravel, and clay. Based on further evaluation, however, it was concluded that only phosphate and limestone (as a salable mineral) have development potential on FMO. Proposals for development will be considered on a case-by-case basis with appropriate NEPA documentation.

Phosphate

Standard Management of Phosphate Leasing

Federal regulations for leasing and development of phosphate are found at 43 CFR 3510 with additional guidance in the BLM 3510 Manual. The legal instruments issued under these regulations and used for exploration and development include prospecting permits, preference right leases, exploration licenses, and competitive leases. In areas not classified as valuable for phosphate, prospecting permits can be issued which, if a valuable deposit is discovered, gives the holder a preference right to a lease. A license can be issued for exploration of an unleased known deposit without any resulting right to a lease. A competitive lease can be issued for an area classified as "valuable".

Prior to issuing a lease the requirements of NEPA must be met. This normally consists of preparing an Environmental Analysis (EA) to determine if

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significant environmental impacts would result, in which case an EIS must be prepared. Prior to exploration or mining activities a reclamation plan must be approved. Reclamation plans must meet the standards of BLM Manual 3041-1, Solid Mineral Reclamation Handbook.

In Florida, federal phosphate leases are typically contained within a larger area of private phosphate ownership. Since the federal interests are closely related with private phosphate operations, duplicates of submissions required by state and local rules are acceptable, to the extent that they do not conflict with and are at least as restrictive as the federal directives.

The state and local government permitting process begins with the Development of Regional Impact (DRI). The DRI details: proposed construction, mining and plant operations, and impacts from mining on the environment (Hoppe 1976: 87). Upon approval of the DRI, the mining company submits, to the Florida Department of Environmental Protection (FLDEP), a conceptual reclamation plan and dredge and fill application. Permits from the Southwest Florida Water Management District (SWFWMD), various county departments, and federal agencies are also required. Mine permitting is a lengthy and costly process. One company's mine required 42 permits from local, state, and federal regulatory agencies. It took 10 years and cost approximately \$15 million (IMC 1992). Table F-1 graphically illustrates the permitting requirements.

Evaluation of Phosphate Potential

Three methods were used to determine the phosphate potential for the federal minerals in Florida:

The high potential was based on the known "C-type" phosphate deposits map in Zellars-Williams (1978), modified slightly to reflect more recent data.

The moderate potential was based on the area defining the Bone Valley Formation on the Florida geologic map by Brooks (1985).

The low potential were those lands formerly classified as phosphate land by the USGS, but outside the high and moderate potential areas.

Phosphate potential considered federal reservations containing: All Minerals, Phosphate Only, and Oil, Gas, and Phosphate. "All Minerals" reservations outside of the high and moderate potential areas were considered "undetermined" as to potential for phosphate. Areas of phosphate potential are illustrated in Map 4.

Reasonably Foreseeable Phosphate Development

Under current technology, only high potential FMO phosphate reserves will be mined. Of approximately 1,891 acres of high potential FMO phosphate, approximately 1,366 acres have already been leased and 320 acres already mined. It is expected that an additional 160 acres will be leased and mined in the foreseeable future. The remaining 365 acres will not be leased in the foreseeable future.

The 160 acres of high potential lands are located in Manatee County and within the Tampa Bay Regional Planning Council District. The legal description of the acreage is as follows:

T. 33 S., R. 21 E.
Section 1, E1/2 of the NE1/4
Section 12, SW1/4 of the SW1/4

T. 33 S., R. 22 E.
Section 18, NE1/4 of the NW1/4

All Tallahassee Meridian

Table F-1. Phosphate Permitting Requirements ^{1/}

	<u>2/</u> Phase	Air	Socio-Economics	Hydrology	Waste Water	Ecology	Water Chemistry	Plan engineering
Monitoring								
Radiation.....	I,V	x		x			x	
Fluoride, SO ₂ , Particulate.....	I,V	x						x
Water Quality.....	I,V				x		x	
Clay Studies.....	I							x
Stream Flow.....	I,II,V			x		x		x
Biological, Archaeological.....	I					x		
Groundwater.....	I			x				
Photogrammetry.....	I							x
Local/County Permits								
Master Plan.....	I	x		x	x	x		x
Rezoning.....	I							
Building.....	III							x
Mining Permit.....	IV							x
Regional								
SWFWMD Water use.....	I			x				x
SWFWMD Works.....	III			x				x
DRI.....	I	x	x	x	x	x	x	x
State								
DEQ Air.....	II,V	x						x
DEQ H ₂ O Effluent.....	II,V				x		x	x
DEQ Dredge & Fill....	II			x		x		x
DEQ Sanitary H ₂ O.....	IV							
DEQ Dike Construction	I,III							x
DNR Master Reclamation Plan....	IV							x
Federal								
EPA-NPDES (EIS).....	I,II	x	x	x	x	x	x	x
COE Dredge & Fill				x		x		x
Oil Spill Prevention.	III							
Air Significant Deterioration.....	III							

COE-Corps of Engineers
EPA-Environmental Protection Agency
NPDES-Non-Point Discharge Elimination System

^{1/}(Adapted from: Zellars & Williams, 1978, 113.)
^{2/}Phase I Pre-DRI Approval
Phase II Post-DRI Approval

Phase III Design Engineering
Phase IV Construction
Phase V Operational

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When the mining company wishes to include federal phosphate in a mine, the company must submit a lease application to the BLM.

All federal phosphate leases in the Central Florida district are competitive. However, the nearest mine to the federal phosphate is the IMC Fertilizer, Inc. Four Corners mine.

The following hypothetical mine assumptions are based on projections made from an IMC Fertilizer public relations handout (IMC 1992):

- a. 7 million short tons phosphate rock produced annually
- b. 700 acres of land mined each year
- c. 8,500 short tons of rock/acre @ 0.45 yd³/ton
- d. Ore zone is 15 feet thick
- e. Overburden is 25 feet thick
- f. 40,300 yd³ overburden and 24,200 yd³ matrix per acre

For a 40-year mine, including a 10-year pre-development process:

700 acres x 30 yr	21,000 acres
Mine facilities (wet rock mill, storage, maintenance, clay ponds, rail lines and roads)	2,000 acres
Total acreage for mine (18 land sections)	23,000 acres
Private	22,840 acres
Federal	160 acres
Federal share of mine	0.7 percent

Mining Procedure

The process of mining phosphate begins about 10 years before the draglines go to work. The process: (1) data acquisition, planning, and land acquisition, (2) mine permitting, and (3) land clearing, construction, and equipment purchases, are all required before mining may begin.

Often the mine is already producing prior to seeking a federal lease; this is true where the federal ownership is in isolated 40-acre tracts. Typically, every fourth quarter-quarter section (40 acres) has already been drilled. However, prior to developing a plan, the company may wish to conduct an exploration program. Rather than seek a federal exploration license, the company will probably drill on private land adjacent to the federal tract. Therefore, an exploration license application will probably not be submitted. However, as the plan develops they may wish to drill every 10 or 2.5 acres, depending on detected anomalies. This drilling will proceed as part of the mine development plan.

For the 160 acres identified for reasonably foreseeable phosphate development, all plant facilities are assumed to be in place, with no additional construction necessary. The 160 acres will be mined along with the surrounding private phosphate. Typically, one 40-acre tract will be mined every three to four years; actual mining occurs in about one to two months.

Mine development will consist of drilling, land clearing, and road construction, as necessary. Land clearing consists of removing the trees, stumps, and other vegetation and, when necessary, dewatering the land. If an access road is necessary, it will most likely be temporary and will be built on unmined land. Where possible, a slurry pipeline is built on the ground surface and within the road right-of-way.

Mining proceeds from adjacent private land onto federal phosphate by spoiling overburden into the previous cut. This cut is typically 325 feet wide, 25 feet deep, and 2,000 to 4,000 feet long. A pit, called a well, is dug on top of unmined phosphate. This well is about 100 feet long, 60 feet wide, and 10 feet deep. After removing the overburden and casting it, the dragline mines the 15 feet of matrix and casts it into the well. Using high pressure water guns, the matrix is slurried with water, passes over a grizzly (screening device), and is pumped into a pipeline for transportation to the wet rock plant. The "walking" dragline moves about 150 feet to the next cutting position. A new

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well is dug and the procedure is repeated. The slurry pipeline "grows" with the mining. The pipeline will share the same access with the mine road.

The slurried matrix moves through the pipeline and, depending on pipe length, may pass through one or more line pumps. At the mill the coarse rock, fine rock, clay, and sand are separated in the washer-screen section. The rock is sent to wet rock storage. The clays are pumped to an above-ground settling pond for dewatering. The sand, containing fine phosphate particles, is sent to the flotation plant where the sand is separated and sent to storage for reclamation. The fine phosphate, called concentrate, is sent to storage.

Water used for mine and mill is in a closed loop; water used for slurring the matrix is used in every process until it is decanted from the clay and returned to slurry new matrix. The Four Corners Mine recycles 97-98 percent of its water (IMC 1992).

The Manatee County Mining and Reclamation Ordinance requires the submission of an engineering monthly water balance estimate. The water balance must account for water input and output losses from the system. Water input comes from several sources: the phosphate matrix, wells drilled to 1,600 feet deep, rainwater, and, when necessary, surface water. Water output losses are: moisture shipped with the product, tailings and waste pebble, evaporation, seepage, and clay entrainment. Deep well water is often required in the flotation process because turbidity upsets the flotation process. Some of the water sent to the sand (20 percent) and clay (70 percent) disposal areas is lost to the system. Evaporation varies by seasonal climatic conditions (Zellars-Williams 1978: 65-68).

Decanting the water from the clay waste is a slow process. The clay waste (called slimes) is sent to the clay settling pond at about 3 percent solids and 97 percent water. The clays, montmorillonite and attapulgite, have an affinity for water. Since sand contains water on the particle surface only, a sand slurry will dewater to about 20 percent water very

quickly. The phosphatic clays have, not only surface water, but interlayer water as well. According to Hoppe (1976: 88) each acre-foot of mined matrix requires 1.5 acre-foot volume for clay slime storage. This is easily seen in the following. The clay settles fairly rapidly to about 17 percent solids in one year, then slows dramatically to about 19 percent in nine years (Hoppe 1976: 88). The hypothetical mine used for this exercise produces approximately 6,800 cubic yards of dry clay per acre or about 1 million cubic yards for the 160 acres of high potential federal phosphate. The large real estate requirements for the clay settling ponds is expensive. Various methods have been used to reduce the water content of the clays, so that the clay ponds may be reclaimed and returned to other uses. One method is the mixing of sand waste with the clay-water slimes in the clay storage ponds. The sand increases the compaction of the clays and forces out the water; which is returned to the water budget. Another method allows the clay to settle in the pond, ditches are dug in the clays to facilitate dewatering, and the water is returned to the water budget.

The final step in the phosphate processing comes at the chemical plant. The chemical plant is a very large capital investment and, as such, one chemical plant will be centrally located to several wet rock mines/mills. After separating the phosphate from the clays and sands, it is still not a usable product. Phosphate in its natural form is only slightly soluble. To become a usable fertilizer, it must be treated. The treatment in use is to react ground phosphate rock with sulfuric acid to form phosphoric acid and gypsum. Uranium is found bound in the crystalline structure of the phosphate. The phosphoric acid is reacted with ammonia to form diammonium phosphate and monoammonium phosphate. Finally, the phosphoric acid is concentrated to form granulated triple super phosphate.

The sulfuric acid is made by burning molten sulfur to make sulfur dioxide then reacting with a catalyst to form sulfur trioxide. The sulfur trioxide is then reacted with water to form sulfuric acid. This is an exothermic process, generating

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heat. One chemical plant has heat exchangers installed to co-generate electricity and take advantage of the formerly wasted heat.

Best Management Practices

Operations on federal minerals will comply with all federal, state, and local laws, regulations, and ordinances.

The FLPMA of 1976 mandates that mineral operations be conducted in an environmentally sound manner. FLPMA requires that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."

Measures needed to mitigate environmental impacts are identified during the preparation of an EA prior to approval of mining and reclamation plans. Such measures may include relocating operations to avoid sensitive resources such as archaeological sites and significant wildlife habitats, and controlling potential sources of air and water pollution with various practices such as water sprays on haul roads and design and maintenance of adequate settling ponds. The pond must be designed to handle rainwater runoff in addition to the mine process water, and to prevent groundwater contamination. The pond dam must be permitted, and all waters leaving or on the property must meet applicable water quality standards of the FLDEP.

Mitigation of long-term impacts requires restoration and/or reclamation of mined land. Prior to exploration or mining activities a reclamation plan must be approved. Reclamation plans must meet the standards of BLM Manual 3041-1, Solid Mineral Reclamation Handbook. Reclamation of the mined land must also follow the regional plan, local plan, and be performed to the standards of the rules of the FLDNR found at Chapter 16C-16, Mandatory Phosphate Mine Reclamation.

As described by Hale (1982) there are four basic reclamation techniques in Florida phosphate: **land and lakes, sand tailings, clay settling ponds, and**

overburden fill. The following paragraphs are paraphrased from Hale (1982: 172-176).

Prior to the development of current reclamation techniques, the land was mined with the overburden cast into the previous mined area and left. This created long narrow rows of steep overburden separated by lakes.

Land and lakes restoration now requires that the overburden be graded to lower slopes, decrease water depth in the lakes, and decrease erosion potential. If necessary, off-site overburden and sand tailings are added to achieve the desired land-lakes ratio and correct slope. Once the land and lakes area is contoured, it is seeded with grass, shrub, and legume based on the final reclamation plan.

Sand tailing reclamation involves pumping the sand tailings into the previously mined areas and covering with overburden. Lands reclaimed in this manner can be reused in a variety of ways from agriculture to industrial and commercial development.

Clay settling ponds are left undisturbed until a crust appears on the surface; then additional trenching is performed to enhance dewatering. Even with dewatering the ponds retain about 20 percent water. Sand tailings may be placed in the ponds to increase the load capability of the land for heavy equipment. The application of sand also increases the settling characteristics of the pond by increasing the percent of solids, thus causing greater consolidation of the clays.

Overburden fill has long been in use in the phosphate industry. It is the placement of the overburden in the previously-mined trench. It can be recontoured easily and is recommended where load bearing strength is required, such as near roadways and railroads. A limitation of the overburden fill technique is the lack of overburden material.

In general, all of these methods are applied to mined land. Today's reclamation often involves a combination of the methods to achieve the best

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reclamation. There are often specific requirements to mitigate environmental impacts through restoration of wetlands or other habitats.

The gypsum formed in the chemical process is problematical. According to the Tampa Bay Regional Planning Council, the byproduct gypsum (phosphogypsum) contains a number of heavy metals: arsenic, cadmium, chromium, lead, magnesium, and iron. The gypsum also contains phosphorus, fluorine, and radionuclides. In 1989, the FLDER reported that water seeping through gypsum stacks was contaminating the aquifer that provides water for 90 percent of the State's population. In 1988, runoff from a Hillsborough stack killed thousands of fish. Best Management Practices/Best Available Control Technology construction requirements for handling gypsum include liners, slurry walls, and perimeter drains. To meet these requirements the gypsum stack created by a chemical plant would require a large area; a gypsum stack covering 380 acres would require a total of 600 acres. New stacks are sited in areas underlain with clay, and a plastic liner is installed to prevent ground water contamination (USBM 1992: 130). Runoff from the gypsum stack is collected and recycled. Long-term groundwater monitoring is required and must continue for 50 years. In 1990, Gardinier, Inc. began a \$5 million project to cover its Hillsborough County gypsum stack and restore former marshlands (USBM 1992: 130).

Research into environmentally-safe uses for the gypsum was being conducted by the Florida Institute of Phosphate Research. The institute is monitoring two county roads constructed by the institute using phosphogypsum.

The mining process disturbs and redistributes the uranium found in the phosphate. Waste clays seem to have the highest uranium, but some is found in the gypsum pile also. In some chemical plants, the uranium is removed from the phosphoric acid and refined to "yellow cake" a concentrate of uranium (U_3O_8). The yellow cake is shipped off-site for processing into fuel. The uranium tends to settle to the bottom in the clay waste

ponds and, potentially, could be taken up by pond vegetation. (TBRPC 1992: 14.7 and 14.23).

Limestone

Standard Management of Salable Limestone

Federal regulations for disposal of mineral materials, including salable limestone, are found at 43 CFR 3600. Under these regulations mineral material sale contracts and free use permits may be issued. Free use permits, however, may be issued only to federal, state or local government agencies.

Prior to issuing a lease, the requirements of NEPA must be met. This normally consists of preparing an EA to determine if significant environmental impacts would result, in which case, an EIS must be prepared. Prior to mining activity, mining and reclamation plans must be approved. Reclamation is required to meet the standards of BLM Handbook H-3041-1, Solid Mineral Reclamation Handbook. In many cases, the federal minerals will be developed in conjunction with private minerals. Where this is the case, the mining and reclamation plans, prepared to meet rules of state and local governments, are acceptable in satisfying the federal requirements, to the extent that they do not conflict with and are at least as restrictive as the federal rules. At a minimum, the BLM must prepare an EA, prepare any stipulations needed, and approve mining and reclamation plans.

The Rules of the FLDNR, Division of Resource Management, Chapter 16C-36 for limestone, effective July 16, 1987 and Chapter 16C-39 for other solid resources, effective January 13, 1989, dictate the reclamation requirements for non-federal salable mineral operations. Permitting varies by county, but in general the following permits are required: Dredge and fill from the FLDEP; Mining/reclamation from the county/city; Works of District from the Water Management District; and, Application for Development Approval and the Development Order from the

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Department of Community Affairs. In some cases, salable mineral operations are exempt from state and/or local requirements; the federal requirements for environmental analyses, mine plan approval, resource protection, bonding and reclamation will be applied in every case.

The FLDNR requires the submission of a conceptual mining plan that includes mine and reclamation sequencing for the life of the mine. The FLDNR rules closely follow the requirements of the federal standards.

Evaluation of Limestone Potential

The limestone potential of federal minerals in Florida was determined using the various publications of the Florida Bureau of Geology. Principally used was "The Limestone, Dolomite, and Coquina Resources of Florida," 1979, Map 3. Only those mineral reservations classified as "All Minerals" were included in the limestone potential determination. Limestone potential areas are illustrated in Map 5.

Reasonably Foreseeable Development

The analysis of the data indicates one tract that will probably be subject to exploration and development within the foreseeable future. The tract will be approximately 160 acres located within a high limestone potential area in the Withlacoochee State Forest in Citrus and/or Hernando Counties. The tract could be developed from an existing operation in the area.

Exploration would consist of drilling holes 100 feet deep or less on a 330-foot grid pattern. For mining, a 40- to 60-foot wide haul road about 1.5 miles in length would be constructed. The development of the tract would be as shown in the hypothetical quarry below.

The following hypothetical limestone quarry is based on the annual state production divided by the number of quarries in the state:

- a. 74 million tons per year
- b. 130 quarries
- c. 0.6 million tons per quarry
- d. 25 feet mining depth (assumed)
- e. 5 feet overburden (saved for reclamation)
- f. 20 feet of rock and clay
- g. 0.74 million cubic yards needed at 2.2 tons per yard and 37 percent recovery
- h. 459 acre-feet of material
- i. 23 acres at 20 feet per year
- j. 0.47 million cubic yards waste
- k. 25 acres required for waste rock and water storage at 20 feet depth
- l. 48 acres per year total
- m. 1,440 acres for 30-year mine
- n. 120 acres for roads and plant
- o. 1,560 acres for project
1,400 acres private
160 acres federal (10 percent)

Mining Procedure

The limestone premining process is similar to that for phosphate mining, described earlier in this appendix. In many cases, the mine will be operational when federal mining rights are sought. The applicant will probably have drilled adjacent to the federal limestone and may or may not seek an exploration license. The company will probably hold valid permits and approved plans, needing only modifications to include the federal interests. Because the quality standards for stone are very narrow, closely spaced drill holes may be needed prior to or during development, to avoid unacceptable rock.

Prior to mining, the land is cleared, and the vegetation is piled and burned. The stone is drilled, and then charges set and blasted to break the stone for hauling. As the mining progresses, a high wall is created, in this hypothetical case 25 feet.

The broken stone is loaded into trucks and hauled to the plant. Some boulders may be too large and left at the pit. At the plant, the stone is sent through a series of screenings and crushing to achieve a salable product. The fine material, clays and finely crushed stone, are sent to the

waste rock pond for decanting of the water for recycling. The washed and graded crushed stone is sent to storage for later shipment.

The limestone mill requires water for washing the rock, wet screening, and moving the waste clay and rock to the disposal pond. The water is decanted from the waste and returned to the system. An environmental hazard from the wet rock crushing operation is the possibility of a sediment spill from the waste pond.

Best Management Practices

Operations on federal minerals will comply with all federal, state, and local laws, regulations, and ordinances.

The FLPMA mandates that mineral operations be conducted in an environmentally sound manner. The FLPMA requires that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."

Measures needed to mitigate environmental impacts are identified during the preparation of an EA prior to approval of mining and reclamation plans. Water pollution must be prevented through adequate design and maintenance of settling ponds. The pond must be designed to handle rainwater runoff in addition to the mine process water, and the pond dam must be permitted. Dust may be reduced with water sprays on haul roads. Sensitive resources, such as archaeological sites and significant wildlife habitats, may be avoided by relocating operations.

Mitigation of long-term impacts requires restoration and/or reclamation of mined land. Prior to mining activity, mining and reclamation plans must be approved. Reclamation is required to meet the standards of BLM Handbook H-3041-1, Solid Mineral Reclamation Handbook. In many cases, the federal minerals will be developed in conjunction with private minerals. Where this is the case, the mining and reclamation plans, prepared to meet rules of the state and local govern-

ments, are acceptable in satisfying the federal requirements, to the extent that they do not conflict with and meet the requirements of the federal rules.

As the overburden is removed during mining operations, the top soil may be saved for later use in reclamation. The overburden is either stored or cast directly into a previously mined pit, for reclamation.

As the mining progresses, oversize boulders (as required by the FLDNR) are placed against the existing highwall covered with overburden, contoured to a 1 foot vertical to 4 feet horizontal slope, and revegetated according to the reclamation plan.

Some of the methods for phosphate reclamation as described by Hale (1982), such as reclamation of settling ponds, are applicable to limestone mining operations.

Reclamation often involves a combination of the methods to achieve the best reclamation. There are often specific requirements to mitigate environmental impacts through restoration of wetlands or other habitats.

Proposed Solid Mineral Development Constraints

The constraints listed below will be implemented as prescribed in the approved RMP. The constraints will apply to management of future phosphate leasing and limestone sales. If the resources protected by the constraints are found on SMA lands, the same stipulation(s), or similar stipulation(s) developed by the SMA, will be applied.

Bald eagle

Constraint: No mining operations will be permitted within a 1,500-foot buffer (primary zone) around bald eagle nests and communal roosting sites and no mining operations will be permitted within the secondary zone, which encompasses the

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area within a mile of the primary zone around bald eagle nest sites.

Objective: To avoid impacting nesting eagles and to provide protection for important nesting and foraging habitat.

Exceptions: This constraint will not apply if no nest site can be identified or if the applicant can document that the nest has not been active for five years. An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Choctawhatchee beach mouse and Perdido Key beach mouse

Constraint: No mining operations will be permitted within Choctawhatchee beach mouse or Perdido Key beach mouse federally designated critical habitat.

Objective: To avoid impacts to Choctawhatchee beach mouse and Perdido Key beach mouse.

Exceptions: None

Coastal strand

Constraint: No mining operations will be permitted in coastal strand habitats.

Objective: To protect this sensitive plant community and the wildlife and plant species associated with it.

Exceptions: An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Florida scrub habitats and associated sensitive species

Constraint: No mining operations will be permitted in Florida scrub habitats (including sand pine scrub and xeric oak scrub).

Objective: To protect rapidly disappearing scrub habitats. These habitats are endemic to Florida and support several federally and state-listed species, as well as several candidates for federal listing and species of concern in Florida.

Exceptions: This constraint will not apply if scrub habitats are found not to exist on the tract. An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Gopher tortoise, gopher frog, sand skink, mole skink and other gopher tortoise commensals

Constraint: Prior to tracts with the following habitats being leased or sold, BLM will conduct an inventory for gopher tortoise and commensal species.

Coastal Strand
Pinelands
Sand Pine Scrub
Sandhill
Mixed Hardwood Pine Forests
Xeric Oak Scrub

Areas with densities higher than 0.8 tortoises per acre will not be offered for lease or sale. In areas where densities are lower than 0.8 per acre, relocation and avoidance will be utilized to mitigate the impacts to tortoise.

Exceptions: An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Red-cockaded woodpecker

Constraint: No mining operations will be permitted within one-half mile of a red-cockaded woodpecker cluster, defined as all cavity trees within a 1,500-foot circle.

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Objective: To protect red-cockaded woodpecker nest sites from disturbance and habitat degradation.

Exceptions: Mining operations may be permitted up to within 200 feet of the cluster if the project can be completed without removing trees over 30 years old, and the action will not reduce the available forage below the threshold established by the USFWS. An exception may be allowed if no active colonies can be found, or if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Sandhills

Constraint: No mining operations will be permitted in sandhills.

Objective: To protect this sensitive plant community and the wildlife and plant species associated with it.

Exceptions: An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other State agencies.

Tropical hardwood hammock

Constraint: No mining operations will be permitted in tropical hardwood hammocks.

Objective: To protect this rare plant community and the sensitive wildlife and plant species associated with it.

Exceptions: An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other State agencies.

Wading bird rookeries

Constraint: No mining operations will be permitted within 900 feet of wading bird rookeries

during the breeding season (February through August) and within 375 feet during the non-breeding season.

Objective: To reduce impacts to nesting wading birds and protect water quality of adjacent foraging areas.

Exceptions: An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Wetlands, aquatic habitats and the associated sensitive species

Constraint: No mining operations will be allowed within 550 feet of an area identified as a wetland. The vegetation or hydrology of a wetland area will not be altered in any way or by any means.

Objective: To minimize the loss, destruction or degradation of wetlands, to preserve and enhance the natural and beneficial value of wetlands areas, to meet the national direction of "no net loss" of wetlands, and to prevent adverse impacts to federally listed plant and animal species and other sensitive species supported by wetland and aquatic habitats.

Exceptions: This constraint will not apply if wetlands are not found on the tract or within 550 feet of the tract.

Use of existing roads which does not require modification or improvement is excepted.

The authorized officer may grant an exception for operations within the 550-foot buffer zone (outside of the area identified as a wetland) if it is determined that the proposed use would not cause adverse impacts to federally listed or other sensitive species.

An exception may be granted to allow mining operations in the wetland area if measures can be taken to either prevent or offset adverse impacts to the wetland area, and a plan to do so through

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compensating and/or enhancing or restoring wetlands has been approved by the authorized officer after coordination with one or more of the following agencies: USFWS, USSCS, COE, and state agencies. Compensatory wetlands may be established off-site, as part of a coordinated reclamation plan. All wetlands will be restored acre for acre and type for type on all lands leased for phosphate.

Wood stork

Constraint: No mining operations will be permitted within 2,500 feet of a wood stork colony nest site during the nesting season or within 1,500 feet during the non-nesting season. No mining opera-

tions will be permitted within 1,000 feet of identified roosting sites year-round.

Objective: To reduce impacts to nesting wood storks and to protect water quality of adjacent foraging areas.

Exception: An exception may be allowed if impacts are offset by a compensation program which has been developed in coordination with the USFWS, and the FGFWFC and/or other state agencies.

Waiver: This constraint will not apply if no evidence of wood stork nesting or roosting is found on or within 2,500 feet of the tract.

Appendix G

Wildlife and Vegetation

Introduction

BLM has management responsibilities in 59 of Florida's 67 counties. This diverse land base reflects the extraordinary diversity of Florida's wildlife and botanical resources. To focus the EIS, only species known or likely to occur in areas where BLM-permitted actions are reasonably foreseeable were included in the analysis.

Methodology

To determine which species might be affected by land use decisions proposed in the RMP, several sources were used. The current Florida Natural Areas Inventory (FNAI) element occurrence records for the state were merged with portions of the Florida Game and Freshwater Fish Commission (FGFWFC) occurrence records. These point data were transferred to a GIS system, which also contained a map of the over 900 FMO tracts. All sensitive species records within a five-mile radius of all FMO tracts in areas with high potential for mineral development were then consolidated into a preliminary list of potentially affected species. Because of the inherent limitations of point data, additional sources were used as a check. A county distribution data base was developed in cooperation with Fish and Wildlife Information Systems. The species list was compared with these county distribution records, species lists for the Blackwater River State Forest and the Withlacoochee State Forest, pertinent environmental assessments, and in the case of surface tracts site, specific surveys, field visits, and personal communication with knowledgeable persons familiar with the wildlife and botanical resources of the area.

General habitat parameters were also used to assess the potential for and extent of impacts to a

species or group of species, and to help predict occurrence of species on FMO. Vegetation communities were mapped on FMO using the Florida Game and Freshwater Fish Commission (FGFWFC) land cover map, which is based on LANDSAT Thematic Mapper imagery. The land cover map was imported into GIS and the land cover types developed by FGFWFC were adopted. These land cover types are described below. The acreages of each of these cover types on FMO is provided in Table 3-2 in the main body of the document.

As the analysis progressed, some wildlife species were dropped from further consideration, either because the species was not expected to occur on FMO where mineral resource development was reasonably foreseeable or the species was not expected to be impacted by standard management practices common to all alternatives. Tables G-1 and G-2 list those wildlife and plant species considered for analysis. Wildlife species names not in bold type were dropped from full analysis in the document. A short discussion of the species dropped from full analysis is provided at the end of Table G-1. All of the plant species on the list were addressed to some extent in the document.

Descriptions of Plant Communities

The following plant community descriptions were adopted from the FGFWFC and were originally described by Terry Gilbert (1992).

Upland Plant Communities

Coastal Strand. The coastal strand occurs on well-drained sandy soils and includes the typically zoned vegetation of the upper beach, nearby dunes, or coastal rock formations. This

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community generally occurs in a long, narrow band parallel to the open waters of the Atlantic Ocean or Gulf of Mexico, and along the shores of some saline bays or sounds in both north and south Florida. This community occupies areas formed along high energy shorelines, and is strongly affected by wind, waves, and salt spray. Vegetation within this community typically consists of low growing vines, grasses, and herbaceous plants with very few small trees or large shrubs. Pioneer or early successional herbaceous vegetation characterizes the foredune and upper beach, while a gradual change to woody plant species occurs in more protected areas landward. Typical plant species include beach morning glory, railroad vine, sea oats, saw palmetto, spanish bayonet, yaupon holly, wax myrtle, along with sea grape, cocoplum, and other tropicals in southern Florida. The coastal strand community only includes the zone of early successional vegetation which lies between the upper beach, and more highly developed communities landward. Adjacent or contiguous community types such as xeric oak scrubs, pinelands, or hardwood forests would therefore be classified and mapped respectively.

Dry Prairies. Dry prairies are large native grass and shrublands occurring on very flat terrain interspersed with scattered cypress domes and strands, bayheads, isolated freshwater marshes, and hardwood hammocks. This community is characterized by many species of grasses, sedges, herbs, and shrubs, including saw palmetto, fetterbush, staggerbush, tar flower, gallberry, blueberry, wiregrass, carpet grasses, and various bluestems. The largest areas of these treeless plains historically occurred just north of Lake Okeechobee, and they were subject to annual or frequent fires. Many of these areas have been converted to improve pasture. In central and south Florida, palmetto prairies, which consist of former pine flatwoods where the overstory trees have been thinned or removed, are also included in this category. These sites contain highly scattered pines which cover less than 10 to 15 percent of an area.

Pinelands. The pinelands category includes north and south Florida pine flatwoods, south Florida pine rocklands, and commercial pine plantations. Pine flatwoods occur on flat sandy terrain where the overstory is characterized by longleaf pine, slash pine, or pond pine. Generally, flatwoods dominated by longleaf pine occur on well-drained sites, while pond pine is found in poorly drained areas, and slash pine occupies intermediated or moderately moist areas. The understory and groundcover within these three communities are somewhat similar and include several common species such as saw palmetto, gallberry, wax myrtle, and a wide variety of grasses and herbs. Generally wiregrass and runner oak dominate longleaf pine sites, fetterbush and bay trees are found in pond pine areas, while saw palmetto, gallberry, and rusty lyonia occupy slash pine flatwoods sites. Cypress domes, bayheads, titi swamps, and freshwater marshes are commonly interspersed in isolated depressions throughout this community type, and fire is a major disturbance factor. An additional pine flatwoods forest type occurs in extreme south Florida on rocklands where the overstory is the south Florida variety of slash pine, and tropical hardwood species occur in the understory. Scrubby flatwoods is another pineland type which occurs on drier ridges, and on or near old coastal dunes. Longleaf pine or slash pine dominate the overstory, while the groundcover is similar to the xeric oak scrub community. Commercial pine plantations are also reluctantly included in the pinelands association. This class includes predominately planted slash pine, although longleaf pine and loblolly pine tracts also occur. Sandpine plantations, which have been planted on severely site prepared sandhill sites in the north Florida panhandle, are also included in this category. An acceptable accurate separation of areas of densely stocked native flatwoods and older planted pine stands with a closed canopy was not consistently possible.

Sand Pine Scrub. Sand pine scrub occurs on extremely well-drained, sorted, sterile sands deposited along former shorelines and islands of ancient seas. This xeric plant community is dominated by an overstory of sand pine and has

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an understory of myrtle oak, Chapman's oak, sand-live oak, and scrub holly. Ground cover is usually sparse to absent, especially in mature stands, and rosemary and lichens occur in some open areas. Sites within the Ocala National Forest which have an overstory of direct seeded sand pine, and an intact understory of characteristic xeric scrub oaks, are also included in this category. Fire is an important ecological management tool, and commonly results in even-aged stands within regenerated sites. The distribution of this community type is almost entirely restricted to within the state of Florida.

Sandhill. Sandhill communities occur in areas of rolling terrain on deep, well-drained, white to yellow, sterile sands. This xeric community is dominated by an overstory of scattered longleaf pine, along with an understory of turkey oak and bluejack oak. The park-like ground cover consists of various grasses and herbs, including wiregrass, partridge pea, beggars tick, milk pea, queen's delight, and others. Fire is an important factor in controlling hardwood competition and other aspects of sandhill ecology. Although many of these sites throughout the state have been modified through the selective or severe cutting of longleaf pine, these areas are still included in the sandhill category.

Xeric Oak Scrub. Xeric oak scrub is a xeric hardwood community typically consisting of clumped patches of low growing oaks interspersed with bare areas of white sand. This community occurs on areas of deep, well-washed, sterile sands, and it is the same understory complex of scrubby oaks and other ground cover species. Also included in this category are sites within the Ocala National Forest which have been clearcut, and are sometimes dominated during the first one to five years by the xeric oak scrub association. The xeric oak scrub community is dominated by myrtle oak, Chapman's oak, sand-live oak, scrub holly, scrub plum, scrub hickory, rosemary, and saw palmetto. Fire is important in setting back plant succession and maintaining viable oak scrubs.

Mixed Hardwood Pine Forests. This community is the southern extension of the Piedmont southern mixed hardwoods, and occurs mainly on the clay soils on the northern Panhandle. Younger stands may be predominantly pines, while a complex of various hardwoods become co-dominated as the system matures over time through plant succession. The overstory consists of shortleaf and loblolly pine, American beech, mockernut hickory, southern red oak, water oak, American holly, and dogwood.

Also included in this category are other upland forests that occur statewide which contain a mixture of conifers, and hardwoods as the co-dominant overstory component. These communities contain longleaf pine, slash pine, and loblolly pine in mixed association with live oak, laurel oak, and water oak, together with other hardwood species characteristic of the upland hardwood hammocks and forests class.

Hardwood Hammocks and Forests. This class includes the major upland hardwood associations that occur statewide on fairly rich sandy soils. Variations in species composition, and the local or spatial distributions of these communities are due in part to differences in soil moisture regimes, soil type, and geographic location within the state. The major variations within this association are mesic hammocks, xeric hammocks, coastal and hydric hammocks, and live oak or cabbage palm hammocks.

The mesic hammock community represents the climax vegetation type within many areas of northern and central Florida. Characteristic species in the extreme north include American beech, southern magnolia, Shumard oak, white oak, mockernut hickory, pignut hickory, sourgum, basswood, white ash, mulberry, and spruce pine. Mesic hammocks of the peninsula are less diverse due to the absence of hardwood species which are adapted to more northerly climates, and are characterized by laurel oak, hop hornbeam, blue beech, sweetgum, cabbage palm, American holly, and southern magnolia.

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Xeric hammocks occur on deep, well-drained, sandy soils where fires has been absent for long periods of time. These open, dry hammocks, contain live oak, sand-live oak, bluejack oak, blackjack oak, southern red oak, sand-post oak, and pignut hickory.

Coastal and hydric hammocks are relatively wet hardwood forests that are found between uplands and true wetlands. These sometimes seasonally wet forests are associated with some non-alluvial peninsula streams, scattered broad lowlands, and are also found in a narrow band along parts of the Gulf and Atlantic coasts where they often extend to the edge of coastal salt marshes. These communities contain water oak, red maple, Florida elm, cabbage palm, red cedar, blue-beech, and sweetgum. Live oak and cabbage palm hammocks are often found bordering large lakes and rivers, and are distributed throughout the prairie region of south central Florida and extend northward in the St. John's River basin. These communities may occur as mixed stands of oak and palm, or one of these species can completely dominate an area.

Tropical Hardwood Hammock. These upland hardwood forests occur in extreme south Florida and are characterized by tree and shrub species on the northern edge of a range which extends southward into the Caribbean. These communities are sparsely distributed along coastal uplands south of a line from about Vero Beach on the Atlantic coast to Sarasota on the Gulf coast. They occur on many tree islands in the Everglades and on uplands throughout the Florida Keys. This cold-intolerant tropical community has very high plant species diversity, sometimes containing over 35 species of trees and about 65 species of shrubs. Characteristic tropical plants include strangler fig, gumbo-limbo, mastic, bustic, lancewood, ironwoods, poisonwood, pigeon plum, Jamaica dogwood, and Bahama lysiloma. Live oak and cabbage palm are also sometimes found within this community. Tropical hammocks in the Florida keys may also contain several plants, including lignum vitae, mahogany, thatch palms, and manchineel, which are extremely rare within the United States.

Wetland Plant Communities

Coastal Salt Marshes. These herbaceous and shrubby wetland communities occur statewide in brackish waters along protected low energy estuarine shorelines of the Atlantic and Gulf coasts. The largest continuous areas of salt marsh occur north of the range of mangroves, and border tidal creeks, bays and sounds. Salt marshes are sometimes interspersed within mangrove areas, and also occur as a transition zone between freshwater marshes and mangrove forests such as in the Ten Thousand Islands area along the southwest Florida coast. Plant distribution within salt marshes is largely dependent on the degree of tidal inundation, and many large areas are completely dominated by one species. Generally, smooth cordgrass typically occupies the lowest elevations immediately adjacent to tidal creeks and pools, while black needlerush dominates less frequently inundated zones. The highest elevations form transitional areas characterized by glasswort, saltwort, saltgrass, sea ox-eye daisy, marsh elder, and saltbush. For the purposes of this project, cordgrass, needlerush, and transitional or high salt marshes are collectively mapped as this single category.

Freshwater Marsh and Wet Prairie. These wetland communities are dominated by a wide assortment of herbaceous plant species growing on sand, clay, marl, and organic soils in areas of variable water depths and inundation regimes. Generally, freshwater marshes occur in deeper, more strongly inundated situations and are characterized by tall emergents, and floating leafed species. Freshwater marshes occur within depressions, along broad, shallow lake and river shorelines, and are scattered in open areas within hardwood and cypress swamps. Also, other portions of freshwater lakes, rivers, and canals which are dominated by floating-leaved plants such as lotus, spatterdock, duck weed, and water hyacinths are included in this category. Wet prairies commonly occur in shallow, periodically inundated areas and are usually dominated by aquatic grasses, sedges, and their associates. Wet prairies occur as scattered, shallow depressions

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within dry prairie areas and on marl prairie areas in south Florida. Also included in this category are areas in southwest Florida with scattered dwarf cypress having less than 20 percent canopy coverage, and a dense groundcover of freshwater marsh plants. Marshes and wet prairies are dominated by various combinations of pickerel weed, sawgrass, maidencane, arrowhead, fire flag, cattail, spike rush, bulrush, white water lily, water shield, and various sedges. Many marsh or wet prairie types, such as sawgrass marsh or maidencane prairie, have been described and so-named based on their dominant plant species.

Cypress Swamp. These regularly inundated wetlands form a forested border along large rivers, creeks, and lakes, or occur in depressions as circular domes or linear strands. These communities are strongly dominated by either bald cypress or pond cypress, with very low numbers of scattered black gum, red maple, and sweetbay. Understory and ground cover are usually sparse due to frequent flooding but sometimes include such species as buttonbush, lizard's-tail, and various ferns.

Hardwood Swamp. These wooded wetland communities are composed of either pure stands of hardwoods, or occur as a mixture of hardwoods and cypress. This association of wetland-adapted trees occurs throughout the state on organic soils and forms the forested floodplains of non-alluvial rivers, creeks, and broad lake basins. Tree species include a mixed overstory containing black gum, water tupelo, bald cypress, dahoon holly, red maple, swamp ash, cabbage palm, and sweetbay.

Bottomland Hardwoods. These wetland forests are composed of a diverse assortment of hydric hardwoods which occur on the rich alluvial soils of silt and clay deposited along several Panhandle rivers including the Apalachicola. These communities are characterized by an overstory that includes water hickory, overcup oak, swamp chestnut oak, river birch, American sycamore, red maple, Florida elm, bald cypress, blue beech, and swamp ash.

Bay Swamp. These hardwood swamps contain broadleaf evergreen trees that occur in shallow, stagnant drainages or depressions often found within pine flatwoods, or at the base of sandy ridges where seepage maintains constantly wet soils. The soils, which are usually covered by an abundant layer of leaf litter, are mostly acidic peat or muck which remain saturated for long periods but over which little water level fluctuation occurs. Overstory trees within bayheads are dominated by sweetbay, swamp bay, and loblolly bay. Depending on the location within the state, other species including pond pine, slash pine, blackgum, cypress, and Atlantic white cedar can occur as scattered individuals, but bay trees dominated the canopy and characterized the community. Understory and ground cover species may include dahoon holly, wax myrtle, fetterbush, greenbriar, royal fern, cinnamon fern, and sphagnum moss.

Shrub Swamp. Shrub swamps are wetland communities dominated by dense, low-growing, woody shrubs or small trees. Shrub swamps are usually characteristic of wetland areas that are experiencing environmental change, and are early to mid-successional in species complement and structure. These changes are a result of natural or man-induced perturbations due to increased or decreased hydroperiod, fire, clear cutting or land clearing, and siltation. Shrub swamps statewide may be dominated by one species, such as willow, or an array of opportunistic plants may form a dense, low canopy. Common species include willow, wax myrtle, primrose willow, buttonbush, and saplings of red maple, sweetbay, black gum, and other hydric tree species indicative of wooded wetlands. In northern Florida, some shrub swamps are a fire-maintained subclimax of bay swamps. These dense shrubby areas are dominated by black titi, swamp cyrilla, fetterbush, sweet pepperbush, doghobble, large gallberry, and myrtle-leaf holly.

Mangrove Swamp. These dense, brackish water swamps occur along low-energy shorelines and in protected, tidally influenced bays of southern Florida. This community is composed of freeze-intolerant tree species that are distributed south of

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a line from Cedar Key on the Gulf coast to St. Augustine on the Atlantic coast. These swamp communities are usually dominated by red, black, and white mangroves that progress in a sere from seaward to landward areas, respectively, while buttonwood trees occur in areas above high tide. Openings and transitional areas in mangrove swamps sometimes contain glasswort, saltwort, and other salt marsh species. All three major species of mangroves are mapped as a single class with no effort made to differentiate these species into separate zones.

Aquatic

Aquatic. This community is comprised of the open water areas of inland freshwater lakes, ponds, rivers and creeks, and the brackish and saline waters of estuaries, bays, tidal creeks, the Gulf of Mexico, and the Atlantic Ocean.

Disturbed Communities

Grassland. These are upland communities where the predominant vegetative cover is very low growing grasses and forbs on intensively managed sites such as improved pastures, lawns, golf courses, road shoulders, cemeteries, or weedy, fallow agricultural fields, etc. This very early successional category includes all sites with herbaceous vegetation during the time period between bare ground, and the shrub and brush stage.

Shrub and Brushland. This association includes a variety of situations where natural upland community types have been recently disturbed through clear-cutting commercial pinelands, land clearing, or fire, and are recovering through natural successional processes. This type could be characterized as an early condition of old field succession, and the community is dominated by various shrubs, tree saplings, and lesser amounts of grasses and herbs. Common species include wax myrtle, saltbush, sumac, elderberry, saw palmetto, blackberry, gallberry, fetterbush, staggerbush, broomsedge, dog fennel, together with oak, pine and other tree seedlings or saplings.

Exotic Plant Communities. These communities are upland and wetland areas dominated by non-native trees that were planted or have escaped and have invaded native plant communities. These exotics include melaleuca, Australian pine, Brazilian pepper, and eucalyptus.

Barren. This class includes highly reflective unvegetated areas such as roads, beaches, active strip mines, tilled agricultural sites, and cleared land on sandy soils. Unvegetated sites in urban areas which include rooftops of buildings, athletic fields, landfills, and parking lots, etc., are also included in this category. Vegetated tracts within urban areas are classified and mapped according to their predominate vegetation cover or plant community type.

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The following special status wildlife species are known or are expected to occur on BLM-administered surface tracts or federal mineral ownership. Those species which may be affected by the alternatives discussed in this document are highlighted in bold type. Species names not highlighted in bold type were considered but dropped from full analysis, either because the species was not expected to occur in areas where reasonably foreseeable development is expected, or the species was not expected to be affected by standard management practices common to all alternatives. Species considered but dropped from full analysis are discussed in a footnote to this table.¹

Table G-1. Wildlife Species Considered for Analysis

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Fish								
Gulf sturgeon (<i>Acipenser oxyrinchus desotoi</i>)	T	SSC	eastern Gulf of Mexico with breeding occurring in major Gulf river systems. Spawning is believed to occur in area of deep water and clean rock, gravel or sand bottoms.	primarily panhandle river systems	Potential to occur in the Blackwater River	Not expected	Not expected	Not expected
Blackmouth shiner (<i>Notropis melanostomus</i>)	C2	E	shallow blackwater pools with no current	Pond Creek, localities in the Blackwater and Shoal rivers in the western panhandle	Potential to occur downstream of FMO	Not expected	Not expected	Not expected
Bluenose shiner (<i>Pteronotropis welaka</i>)	-	SSC	quiet, often weedy waters, particularly with deeper pools	western panhandle and middle of St. Johns River drainage in eastern peninsular Florida	Potential to occur downstream of FMO	Not expected	Not expected	Not expected
Crystal darter (<i>Ammocrypta asprella</i>)	C2	T	sand and gravel bars in large rivers	upper reaches of the Escambia River in extreme western panhandle	Potential to occur downstream of FMO	Not expected	Not expected	Not expected
Harlequin darter (<i>Etheostoma histrio</i>)	-	SSC	variety of river habitats	few records in Escambia River in extreme western panhandle	Potential to occur downstream of FMO	Not expected	Not expected	Not expected

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Okaloosa darter (<i>Etheostoma okaloosae</i>)	E	E	low to moderate sized groundwater-fed streams	boggy and rocky bayous in Okaloosa and Walton counties, majority of habitat on Eglin Air Force Base	Potential to occur downstream of FMO	Not expected	Not expected	Not expected
Saltmarsh topminnow (<i>Fundulus jenkinsi</i>)	-	SSC	brackish and salt water marshes	extreme western panhandle	Potential to occur downstream of FMO	Not expected	Not expected	Not expected
Amphibians								
Flatwoods salamander (<i>Ambystoma cingulatum</i>)	C2	-	pine flatwoods/wire-grass communities near ponds without predatory fish	panhandle and very northern peninsula	Confirmed	Not expected	Not expected	Potential
Gopher frog (<i>Rana capito</i>)	C2	SSC	xeric pine and scrub communities with ponds or ephemeral wetlands, with gopher tortoise	panhandle and northern 2/3 of peninsula	Confirmed	Confirmed	Potential	Confirmed
Pine Barrens treefrog (<i>Hyla andersonii</i>)	-	SSC	seepage slopes and bogs	four counties in the western panhandle, including Santa Rosa, Okaloosa, Walton and Holmes counties	Confirmed	Not expected	Not expected	Not expected

000103

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Reptiles								
Alligator snapping turtle (<i>Macrochelys temminckii</i>)	C2	SSC	deep rivers, canals, lakes and swamps	gulf river drainages	Potential	Not expected	Not expected	Not expected
American alligator (<i>Alligator mississippiensis</i>)	T (S/A)	SSC	rivers, swamps, lakes and ponds	state-wide in suitable habitat	Potential	Confirmed	Potential	Potential
Atlantic green sea turtle (<i>Chelonia mydas</i>)	E	E	pelagic, nesting on coastal beaches	limited nesting, primarily on eastern coast, has been recorded at Eglin Air Force Base	Potential	Not expected	Not expected	Potential
Atlantic loggerhead sea turtle (<i>Caretta caretta</i>)	T	T	pelagic, nesting on coastal beaches	majority of coastal beaches, highest densities from Brevard County south to Broward County	Potential	Not expected	Not expected	Confirmed
Eastern indigo snake (<i>Drymarchon corais couperi</i>)	T	T	variety of upland and wetland habitats	state-wide in suitable habitat	Confirmed	Confirmed	Potential	Potential
Florida pine snake (<i>Pituophis melanoleucus mugitus</i>)	C2	SSC	xeric pine and scrub communities	all but southern 1/3 of peninsula	Potential	Confirmed	Potential	Potential
Florida scrub lizard (<i>Sceloporus woodi</i>)	C2	-	pine scrub, xeric oak scrub, and sandhills	coastal and interior scrub habitats	Not expected	Potential	Not expected	Confirmed
Gopher tortoise (<i>Gopherus polyphemus</i>)	C2	SSC	upland sandy xeric habitats	state-wide in suitable habitat	Confirmed	Confirmed	Potential	Confirmed

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Short-tailed snake (<i>Stilosoma extenuatum</i>)	C2	-	longleaf pine/turkey oak associations, occasionally in upland hammock and sand pine scrub	west central peninsula	Not expected	Potential	Not expected	Not expected
Birds								
Arctic peregrine falcon (<i>Falco peregrinus tundrius</i>)	T	E	variety of habitats	wintering throughout Florida, particularly along coast	Confirmed	Potential	Potential	Confirmed
Bald eagle (<i>Haliaeetus leucocephalus</i>)	E	T	near lakes, rivers and coast	state-wide	Confirmed	Confirmed	Potential	Confirmed
Eastern brown pelican (<i>Pelecanus occidentalis</i>)	-	SSC	coastal beaches, mangrove swamps and islands	entire coast	Potential	Not expected	Not expected	Confirmed
Florida burrowing owl (<i>Speotyto cunicularia</i>)	-	SSC	breeding on high sandy ground with low ground cover	breeding in southern 1/2 of peninsula	Not expected	Not expected	Potential	Not expected
Florida sandhill crane (<i>Grus canadensis pratensis</i>)	-	T	dry prairies, pastures, marshes	state-wide	Potential	Potential	Potential	Not expected
Florida scrub jay (<i>Aphelocoma coerulescens</i>)	T	T	scrub communities with oak component	peninsular Florida in suitable habitat	Not expected	Potential	Potential	Confirmed
Least tern (<i>Sterna antillarum</i>)	-	T	open flat beaches devoid of vegetation	generally coastal	Not expected	Not expected	Not expected	Potential

000105

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Limpkin* (<i>Aramus guarauna</i>)	-	SSC	wetlands	eastern panhandle and peninsula	Not expected	Confirmed	Potential	Potential
Little blue heron* (<i>Egretta caerulea</i>)	-	SSC	wetlands	state-wide, breeding primarily in southern peninsula coast and islands	Potential	Confirmed	Potential	Potential
Osprey (<i>Pandion haliaetus</i>)	-	SSC in Monroe County	near lakes, rivers and coast	state-wide	Confirmed	Confirmed	Potential	Confirmed
Piping plover (<i>Charadrius melodus</i>)	T	T	open sand, tidal and mud flats often with freshwater inlets	winters on Gulf and Atlantic coasts	Not expected	Not expected	Not expected	Potential
Red-cockaded woodpecker (<i>Picoides borealis</i>)	E	T	mature, open park-like stands of pine, often longleaf pine with red-heart disease	throughout state in suitable habitat	Confirmed	Confirmed	Not expected	Not expected
Southeastern American kestrel (<i>Falco sparverius paulus</i>)	C2	T	open habitats with perches for hunting	all but extreme tip of southern peninsula and Keys	Confirmed	Confirmed	Potential	Not expected
Southeastern snowy plover (<i>Charadrius alexandrinus tenuirostris</i>)	C2	T	open sand and tidal flats often with freshwater inlets	gulf coast beaches	Not expected	Not expected	Not expected	Potential
Snowy egret* (<i>Egretta thula</i>)	-	SSC	wetlands	state-wide, rare breeder in panhandle	Confirmed non-breeding	Confirmed breeding	Potential	Potential
Tri-colored heron* (<i>Egretta tricolor</i>)	-	SSC	wetlands	state-wide, infrequent breeder west of the Apalachicola drainage	Confirmed non-breeding	Confirmed breeding	Potential	Potential

000106

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Wood stork (<i>Mycteria americana</i>)	E	E	wetlands	state-wide, breeding in peninsula	Potential	Confirmed	Potential	Potential
Mammals								
Choctawhatchee beach mouse (<i>Peromyscus polionotus allopkyrs</i>)	E	E	mature coastal beach dunes	currently limited to three areas: Topsail Hill area and Grayton Beach Recreation Area in Walton County, and Shell Island in Bay County.	Confirmed	Not expected	Not expected	Not expected
Eastern chipmunk (<i>Tamias striatus</i>)	-	SSC	hardwood forest and mixed hardwood pine forest	northern portions of five counties in the western panhandle	Confirmed	Not expected	Not expected	Not expected
Florida black bear (<i>Ursus americanus floridanus</i>)	C2	T**	a variety of habitats, primarily forested areas	state-wide in suitable habitat	Confirmed	Potential	Potential	Potential
Florida mouse (<i>Peromyscus floridanus</i>)	C2	SSC	fire maintained xeric uplands on sandy soils, including sandhills, scrub and scrubby flatwoods	central peninsula and Atlantic coast	Not expected	Potential	Potential	Confirmed
Florida panther (<i>Felis concolor coryi</i>)	E	E	variety of habitats	reproducing only in southern Florida	Potential	Not expected	Not expected	Not expected
Lower Keys marsh rabbit (<i>Sylvilagus palustris hefneri</i>)	E	E	marshes and areas with low vegetative cover	lower keys, from Big Pine to Boca Chica	Not expected	Not expected	Not expected	Potential

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Perdido Key beach mouse (<i>Peromyscus polionotus trissyllepsis</i>)	E	E	sand dunes along Gulf coast beaches	Perdido Key, Gulf Islands National Seashore	Confirmed	Not expected	Not expected	Not expected
Sherman fox squirrel (<i>Sciurus niger shermani</i>)	C2	SSC	mature longleaf pine/turkey oak sandhills and flatwoods, ideally with access to live oak forest	eastern panhandle to central Florida	Not expected	Confirmed	Potential	Not expected
Silver rice rat (<i>Oryzomys argentatus</i>)	E	E	upland to marine interface, buttonwood transition zones, salt flats and coastal strand	Lower Keys	Not expected	Not expected	Not expected	Potential
Southeastern brown bat (<i>Myotis austroriparius</i>)	C2	-	in Florida, primarily a cave dwelling bat	panhandle south through peninsula to Manatee County	Not expected ..	Confirmed	Not expected	Not expected
St. Andrew beach mouse (<i>Peromyscus polionotus peninsularis</i>)	C2	E	coastal beach dunes	currently on the St. Joseph peninsula and Tyndall Air Force Base	Not expected	Not expected	Not expected	Potential
West Indian manatee (<i>Trichechus manatus</i>)	E	E	coastal, estuarine and some riverine habitats	coastal and major inland waterways in peninsula	Not expected	Not expected	Not expected	Confirmed
Invertebrates (Molluscs)								
Narrow pigtoe (<i>Fusconaia escambia</i>)	C2	-	riverine in muddy sand in slight current	Yellow and Escambia drainages in western panhandle	Potential to occur downstream of FMO	Not expected	Not expected	Not expected

Table G-1. Continued.

Animal Name	Federal Status ²	State Status ³	Habitat	Distribution in Florida	Status on Surface Tracts and High Potential Federal Mineral Ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Invertebrates (Insects)								
American sand burrowing mayfly (<i>Dolania americana</i>)	C2	-	NA	NA	Confirmed	Not expected	Not expected	Not expected
Blackwater sand-filtering mayfly (<i>Momoeoneuria donani</i>)	C2	-	NA	NA	Confirmed	Not expected	Not expected	Not expected
Say's Spiketail (<i>Cordulegaster sayi</i>)	C2	-	NA	NA	Confirmed	Not expected	Not expected	Not expected
Zigzag Black River Caddisfly (<i>Agarodes ziczac</i>)	C2	-	NA	NA	Confirmed	Not expected	Not expected	Not expected

* These species are discussed generally under wading birds.
** Not applicable in Baker and Columbus counties and Apalachicola National Forest.
*** No maternity caves have been identified.

1. Wildlife species considered but dropped from further analysis.

- Blackmouth shiner (*Notropis melanotomus*), crystal darter (*Ammocrypta asprella*), harlequin darter (*Etheostoma histrio*), Okaloosa darter (*Etheostoma okaloosa*), and saltmarsh topminnow (*Fundulus jenkinsi*): all of these fish have potential to occur on FMO in the panhandle, but are not known to occur in the Blackwater River State Forest, where mineral development is reasonably foreseeable. Standard management common to all alternatives include drill pad berms and a 300-foot setback from all rivers and streams. These conditions are expected to alleviate any potential impacts to these downstream fishes.
- Atlantic green sea turtle (*Chelonia mydas*) has been recorded on Eglin Air Force Base, however it is not likely to be affected by actions taken on the four small BLM beachfront tracts.
- Arctic peregrine falcon (*Falco peregrinus tundrius*) has potential to occur on surface tracts or FMO throughout Florida. However, no actions are anticipated that would adversely affect this wintering population.
- Brown pelican (*Pelecanus occidentalis*) could occur on all of the BLM beachfront tracts. However, use in these areas is expected to be largely limited to offshore fishing. None of the alternatives is expected to adversely affect this species.

Table G-1. Concluded.

- Least tern (*Sterna antillarum*) may loaf and forage in the vicinity of the BLM beachfront tracts, but no nesting has been recorded. None of the alternatives are expected to significantly alter use pattern of this species.
- Florida panther (*Felis concolor coryi*) has potential to occur on FMO with high potential for oil and gas development in southern Florida. However, no mineral development is expected to occur on the few FMO tracts in this area.
- Key deer (*Odocoileus virginianus clavium*) are found on portions of Sugarloaf Key, however, no deer have been recorded near the Sugarloaf Key surfact tracts for over 10 years, according to manager of the Key Deer National Wildlife Refuge. It is unlikely that actions taken on these two tracts will affect key deer.
- Perdido Key beach mouse (*Peromyscus polionotus trisyllepsis*) and Choctawhatchee beach mouse (*Peromyscus polionotus allophrys*) are expected to occur on FMO. Portions of federally designated critical habitat for these beach mice are located on FMO. However, no mineral development is expected in these areas.
- Narrow pigtoe mussel (*Fusconaia escambia*) has potential to occur downstream of the Blackwater River State Forest, but standard management common to all alternatives, including drill pad berms and a 300-foot setback from rivers and streams, is not expected to impact this species.
- American sand-burying mayfly (*Dolania americana*), Blackwater sand-filtering mayfly (*Homoeoneuria dolani*), Say's spiketail dragonfly (*Cordulegaster sayi*), and zigzag blackwater caddisfly (*Agarodes ziczac*) occur on the Blackwater River State Forest. However, standard management common to all alternatives, including drill pad berms and a 300-foot setback from rivers and streams, is not expected to impact these species.

2. Federal status abbreviations:

- E - Endangered
- T - Threatened
- T (S/A) - Threatened due to similarity of appearance.
- C1 - A candidate for federal listing for which there is enough substantial information on biological vulnerability and threats to justify listing.
- C2 - A candidate for federal listing for which there is enough substantial information on biological vulnerability, but for which not enough information exists to justify listing.

3. State status abbreviations:

- E - Endangered
- T - Threatened
- SSC - Species of Special Concern

000110

Table G-2. Plant Species Considered for Analysis

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
A wild coco (<i>Pteroglossaspis ecristata</i>)	C2	T	pine rockland, upland hardwood forest, scrubby flatwoods, mesic flatwoods (on moist sandy soils)	ALAC,BAKE,CITR,DADE, FLAG,HARD,HIGH,HILL,LIBE HARI,HART,SARA,SEMI, STJO,WAKU	Not expected	Potential	Not expected	Not expected
Apalachicola rosemary (<i>Conradina glabra</i>)	E	T	sandhill, longleaf pine/wire grass	LIBE,SANTA ¹	Confirmed	Not expected	Not expected	Not expected
Auricled spleenwort (<i>Asplenium auritum</i>)	-	E	slough, hydric hammock (epiphytic on trees)	CITR,COLL,DADE,HERN, HIGH,HILL,PASC,SUMT, VOLU	Not expected	Confirmed	Not expected	Not expected
Baltzell's sedge (<i>Carex baltzellii</i>)	C/2	E	slope forest (moist sandy loams)	BAY,CALH,ESCA,GADS, LIBE,OKAL,SANT,WALT, WASH	Potential	Not expected	Not expected	Not expected
Beach jacquemontia (<i>Jacquemontia reclinata</i>)	E	E	beach dunes and coastal strand openings	BROW,DADE,PALM	Not expected	Not expected	Not expected	Confirmed
Bog-button (<i>Lachnocaulon digynum</i>)	C2	-	exposed sands on seepage slopes, wet flatwoods, bog	BAY,ESCA,LIBE,OKAL, SANT	Confirmed	Not expected	Not expected	Not expected
Brooksville bellflower (<i>Campanula robin-siae</i>)	E	E	wet prairie, along edges of ponds, seepage slopes	HERN	Not expected	Potential	Not expected	Not expected
Chapman's butterwort (<i>Pinguicula planifolia</i>)	C2	E	wet flatwoods, seepage slopes, bogs, in ditches	BAY,CALH,ESCA,FRAN, GULF,JACK,LIBE,SANT, WALT,WASH	Confirmed	Not expected	Not expected	Not expected

¹Final results on the taxonomic work on the Blackwater population is not complete. This population may be reclassified as the more common (*Conradina canescens*).

Table G-2. Continued.

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Cooley's water-will <i>Justicia cooleyi</i>	E	T	upland mixed forest	HERN, LAKE, SUMT	Not expected	Potential	Not expected	Not expected
Craighead's nodding caps <i>(Triphora craigheadii)</i>	C2	T	upland hardwood forest, surface of rotting logs and shaded rock outcrops	CITR, HERN	Not expected	Potential	Not expected	Not expected
Cruise's golden aster <i>(Chrysopsis gossypina cruiseana)</i>	C2	E	coastal strand and grassland, particularly blowouts and openings	ESCA, OKAL, SANT, WALT	Not expected	Not expected	Not expected	Confirmed
Curtis sandgrass <i>(Calamovilfa curtissii)</i>	C/2	E	mesic and wet flatwoods depression marshes wet prairies	BAY, BREV, OKAL, SANT, WALT, DUVA	Potential	Not expected	Not expected	Not expected
Curtiss' milkweed <i>(Asclepias curtissii)</i>	-	E	scrub, scrubby flatwoods, xeric hammock	BREV, BROW, CHAR, CLAY, COLL, DESO, ESCA, HARD, HERN, HIGH, HILL, INDI, LAKE, LEE, MANA, MARI, MART, ORAN, OSCE, PALM, PINE, POLK, PUTN, STLU	Potential	Not expected	Not expected	Not expected
Downy shield fern <i>(Thelypteris dentata)</i>	-	T	moist hammocks	-	Not expected	Potential	Potential	Not expected
Drummond's yellow-eyed grass <i>(Xyris drummondii)</i>	C2	-	wet flatwoods, bog, seepage slopes, ditches	BAY, ESCA, GULF, LIBE, SANT	Potential	Not expected	Not expected	Not expected
Dwarf spleenwort <i>(Asplenium auitum)</i>	-	E	upland mixed forest, hydric hammock (on limestone)	ALAC, CITR, HERN, MARI	Not expected	Potential	Not expected	Not expected
Ebony spleenwort <i>(Asplenium platyneuron)</i>	-	T	hammocks	-	Not expected	Potential	Potential	Not expected
Florida anise <i>(Illicium floridanum)</i>	-	T	slope forest, flood plain forest, baygall and seepage stream banks	BAY, CALH, ESCA, GADS, JACK, LIBE, OKAL, SANT, WAKU, WASH, WALT	Confirmed	Not expected	Not expected	Not expected

Table G-2. Continued.

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Florida pondweed (<i>Potamogeton floridanus</i>)	C2	-	endemic to Blackwater River	SANT,OKAL	Potential	Not expected	Not expected	Not expected
Florida spiny-pod (milkweed) (<i>Matelea floridana</i>)	C2	E	upland mixed forest, upland hardwood forest	ALAC,BARD,CITR,CLAY, COLU,DUVA,HERN,JACK, LAKE,LEVY,LIBE,MARI, ORAN,VOLU	Not expected	Potential	Not expected	Not expected
Four-petal paw-paw (<i>Asimina tetramera</i>)	E	E	scrub or ecotones with scrubby flatwoods	MART,PALM	Not expected	Not expected	Not expected	Confirmed
Fuzzy-wuzzy air-plant (<i>Tillandsia pruinosa</i>)	-	E	epiphytic in strand swamps	COLL	Potential	Not expected	Not expected	Not expected
Godfrey's butterwort (<i>Pinguicula ionantha</i>)	T	E	wet flatwoods, bogs, seepage slopes, in shallow water	BAY,FRAN,GULF,LIBE	Not expected	Not expected	Not expected	Potential
Godfrey's golden aster (<i>Chrysopsis godfreyi</i>)	C2	-	coastal grassland, beach dune	BAY,ESCA,OKAL,SANT, WALT	Potential	Not expected	Not expected	Not expected
Golden polypody (<i>Phlebodium aureum</i>)	-	T	hammocks, often epiphytic on cabbage palms	-	Not expected	Potential	Potential	Confirmed
Green ladies'-tresses (<i>Spiranthes polyantha</i>)	C2	E	rockland hammock, upland mixed forest (over limestone)	CITR,DADE,DUVA,HERN, MART,STJO	Not expected	Potential	Not expected	Not expected
Gulf coast lupine (<i>Lupinus westianus</i>)	C2	T	beach dune, scrub, disturbed areas	BAY,ESCA,FRAN,GULF, OKAL,SANT,WALT,WASH	Potential	Not expected	Not expected	Not expected
Hairy-peduncled beak-rush (<i>Rhynchospora crinipes</i>)	C2	-	blackwater stream shelves and sandy banks	SANT	Potential	Not expected	Not expected	Not expected

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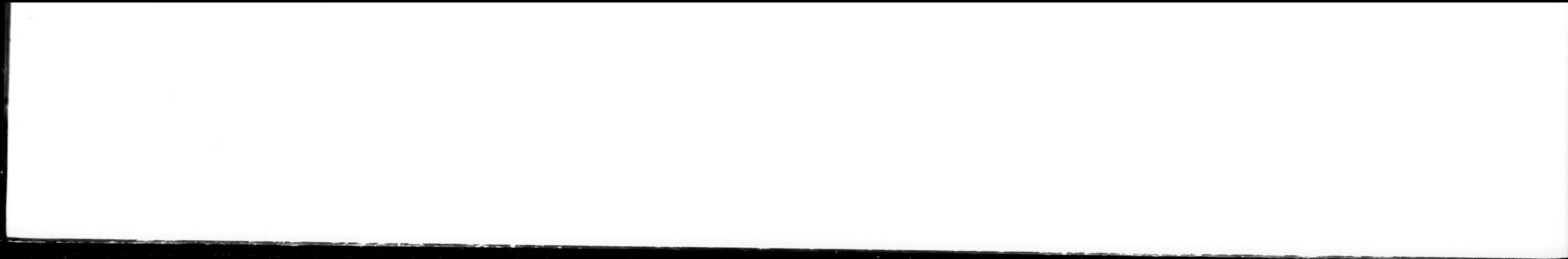


Table G-2. Continued.

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Hairy wild indigo (<i>Baptisia hirsuta</i>)	C/2	T	sandhill, mesic flatwoods scrubby flatwoods	HOLM,OKAL,SANT,WALT	Potential	Not expected	Not expected	Not expected
Harper's yellow-eyed grass (<i>Xyris scabrifolia</i>)	C2	T	seepage slope, wet prairie, bog	BAY,CALH,ESCA,GULF,LIBE	Confirmed	Not expected	Not expected	Not expected
Heartleaf (<i>Hexastylis arifolia</i>)	-	T	slope forest, seepage stream banks	ESCA,JEFF,LEON,LIBE, SANT,WALT,WASH	Potential	Not expected	Not expected	Not expected
Hummingbird flower (<i>Macranthera flammea</i>)	-	E	seepage slope and stream banks, flood plain swamp	BAY,CALH,ESCA,FRAN, JACK,LEON,LIBE,OKAL, SANT,WALT	Confirmed	Not expected	Not expected	Not expected
Incised groove-bur (<i>Agrimonia incisa</i>)	C2	-	sandhill, upland pine forest, edges of upland hardwood forest	ALAC,CITR,COLU,DIXI, DUVA,GADS,GILC,HERN, JACK,MADI,MARI,POLK, SUWA,WAKU,WASH	Not expected	Confirmed	Not expected	Not expected
Joeweed (<i>Jacquinia keyensis</i>)	-	T	coastal strand, coastal grassland, coastal rocklands	DADE,LEE,MONR	Potential	Not expected	Not expected	Not expected
Large-flowered rosemary (<i>Conradina grandiflora</i>)	C2	E	scrub and coastal strand	BREV,BROW,INDI,MART,OS CE,PALM,STLU,VOLU	Not expected	Not expected	Not expected	Confirmed
Large-leaved jointweed (<i>Polygonella macrophylla</i>)	C1	T	scrub	BAY,ESCA,GADS,OKAL, SANT,WAKU,WALT	Confirmed	Not expected	Not expected	Not expected
Mountain laurel (<i>Kalmia latifolia</i>)	-	T	slope forest, seepage stream banks	BAY,CALH,ESCA,GADS, HOLM,LEON,LIBE,OKAL, SANT,WALT,WASH	Potential	Not expected	Not expected	Not expected
Netted chain fern (<i>Woodardia areolata</i>)	-	T	swamps and wet woods	-	Not expected	Potential	Potential	Not expected

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Table G-2. Continued.

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Nodding pinweed (<i>Lechea cornuta</i>)	C2	E	scrub	BREV,BROW,COLL,HARD,HERN,HIGH,HILL,INDI,LEE,MAMA,MART,OSCE,PALM,PINE,POLK,SEMI,STLU,	Not expected	Not expected	Confirmed	Not expected
Orange azalea (<i>Rhododendron austrinum</i>)	-	E	slope forest, upland mixed forest, bottomland forest, seepage slope banks	CALH,ESCA,GADS,HOLM,JACK,LEON,LIBE,OKAL,SANT,WALT,WASH	Confirmed	Not expected	Not expected	Not expected
Panhandle lily (<i>Lilium iridollae</i>)	C2	E	baygall, seepage slopes, blackwater stream banks	ESCA,OKAL,SANT,WALT	Confirmed	Not expected	Not expected	Not expected
Panhandle meadowbeauty (<i>Rhexia salicifolia</i>)	C2	-	shallow water in sandhill upland lakes	BAY,LEON,WAKU,WALT,WASH	Potential	Not expected	Not expected	Not expected
Piedmont water-milfoil (<i>Myriophyllum laxum</i>)	C2	-	flood plain swamp, upland sandhill lake, blackwater stream, ditches	ESCA,FRAN,GULF,JACK,LEON,LIBE,OSCE,PASC,PUTN,SANT,WALT	Potential	Not expected	Not expected	Not expected
Pigmy-pipes (<i>Monotropsis reynoldsiae</i>)	C2	E	upland hardwood forest (parasitic often under dogwood <i>Cornus florida</i>)	BREV,HERN,MARI,STJO,VOLU	Not expected	Potential	Not expected	Not expected
Pineland hoary-pea (<i>Tephrosia mohrii</i>)	C2	-	sandhill	OKAL,WALT	Potential	Not expected	Not expected	Not expected
Pine pinweed (<i>Lechea divaricata</i>)	C2	E	scrub, scrubby flatwoods	BREV,DADE,HERN,HIGH,HILL,MANA,MART,PALM,PINE,VOLU	Not expected	Not expected	Potential	Confirmed
Pondspice (<i>Litsea aestivalis</i>)	C2	T	hydric hammock, baygall on peaty soils	CLAY,COLU,DIXI,LAFA,LEVY,MARI,OKAL,PUTN,TAYL	Potential	Not expected	Not expected	Not expected

Florida Agencies

FGFWFC- Florida Game and Freshwater Fish Commission

FLDA - Department of Agriculture

FLDEP - Department of Environmental Protection

FLDER - Department of Environmental Regulation

FLDF - Department of Forestry

FLDNR - Department of Natural Resources

SHPO - State Historic Preservation Office

SWFWMD - South Florida Water Management District

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Auffenber, W., and R. Franz. 1982. The status distribution of the gopher tortoise (*Gopherus polyphemus*). In: Burv. R. B. (ed). North American Tortoises: Conservation and

Table G-2. Continued.

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Pyramid magnolia (<i>Magnolia pyramidata</i>)	-	E	slope forest	BAY,CALH,GADS,JACK, LEON,LIBE,OKAL,SANT, WALT,WASH	Potential	Not expected	Not expected	Not expected
Sand spikemoss (<i>Selaginella arenicola</i>)	-	T	dry pinelands, scrub and coastal dunes		Not expected	Not expected	Not expected	Confirmed
Serviceberry holly (<i>Ilex amelanchar</i>)	-	T	flood plain forest, flood plain swamp, seepage stream banks	ESCA,HOLM,JACK,LIBE, SANT,	Potential	Not expected	Not expected	Not expected
Silky camellia (<i>Stewartia malacodendron</i>)	-	E	slope forest, upland mixed forest baygall (acid soils)	BAY,CALH,ESCA,GADS, LIBE,OKAL,SANT,WALT, WASH	Potential	Not expected	Not expected	Not expected
Sinkhole fern (<i>Blechnum occidentale</i>)	-	E	slope forest (thin soil over limestone)	ALAC,CITR,HERN,PASC	Not expected	Potential	Not expected	Not expected
Southern lip fern (<i>Cheilanthes microphylla</i>)	-	E	upland mixed forest, shell mound, rockland hammock (on limestone)	ALAC,CITR,COLL,DADE, DUVA,LEE,MONR,WASH	Not expected	Potential	Not expected	Not expected
Southern red lily (<i>Lilium catesbaei</i>)	-	T	mesic flatwoods, wet prairie wet flatwoods, seepage slopes (usually with grasses)	State-wide except for extreme southern Florida (MONR,DADE,BROW counties).	Confirmed	Not expected	Not expected	Not expected
Spiny hackberry (<i>Celtis pallida</i>)	-	E	shell mound, maritime hammock	LEE	Potential	Not expected	Not expected	Not expected
Spoon-leaved sundew (<i>Drosera intermedia</i>)	-	T	seepage slopes and stream banks, wet flatwoods and ditches	BAY,CALH,ESCA,FRAN, HIGH,LEON,LEVY,MARI, OKAL,PUTN,SANT,WALT	Confirmed	Not expected	Not expected	Not expected

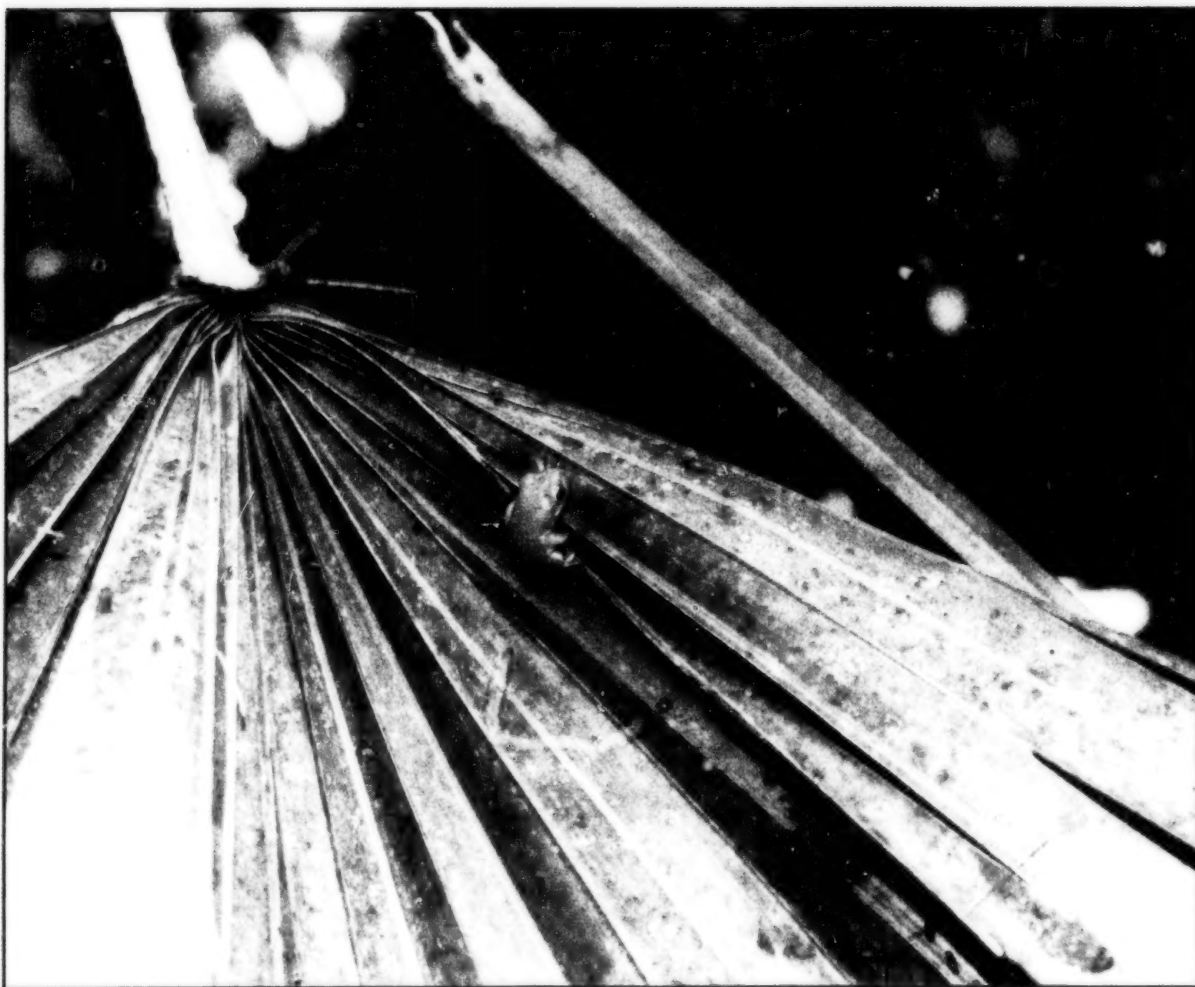
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Table G-2. Concluded.

Plant Name	Federal Status	State Status	Habitat	Confirmed County Distribution	Status on surface tracts and high potential federal mineral ownership			
					Oil & Gas	Limestone	Phosphate	Surface Tracts
Sweet pitcher-plant (<i>Sarracenia rubra</i>)	C2	E	wet prairie, bog, seepage slope and stream banks, wet flatwoods	ESCA, OKAL, SANT, WALT	Confirmed	Not expected	Not expected	Not expected
Telephus spurge (<i>Euphorbia telephioides</i>)	E	T	mesic flatwoods, particularly disturbed wiregrass areas	BAY, FRAN, GULF	Not expected	Not expected	Not expected	Potential
Terrestrial peperomia (<i>Peperomia humilis</i>)	-	E	maritime hammock, upland hardwood forest, slough, hydric hammock, tidal swamps (rarely epiphytic; usually on thin humus over calcareous substrate)	BREV, CITR, COLL, DADE, DUVA, MART, MONR, ORAN, STJO, SUMT, VOLU	Not expected	Potential	Not expected	Not expected
Trailing arbutus (<i>Epigae repens</i>)	-	E	bluff, slope forest, mixed hardwood forest	ESCA, GADS, LIBE, OKAL, SANT	Potential	Not expected	Not expected	Not expected
Twistpine prickly pear cactus (<i>Opuntia compressa</i>)	-	T	scrub, pinelands		Not expected	Not expected	Not expected	Confirmed
White bird's-in-a-nest (<i>Macbridea alba</i>)	E	T	mesic flatwoods, seepage slopes	BAY, FRAN, GULF, LIBE	Not expected	Not expected	Not expected	Potential
White-top pitcher-plant (<i>Sarracenia leucophylla</i>)	C2	E	wet prairie, bog, seepage slope and stream banks, wet flatwoods	BAY, CALH, ESCA, FRAN, GULF, HOLM, LIBE, OKAL, SANT, WALT	Confirmed	Not expected	Not expected	Not expected
Wild pine (<i>Tillandsia balbisiana</i>)	-	T	pinelands, hammocks and scrub		Not expected	Not expected	Not expected	Confirmed
Yellow fringeless orchid (<i>Platanthera integræ</i>)	-	T	mesic flatwoods, wet prairie, seepage slope	BAY, ESCA, FRAN, GULF, JACK, LIBE, NASS, OKAL, ORAN, OSCE, SANT, WAKU, WALT, WASH	Confirmed	Not expected	Not expected	Not expected

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Glossary and References Cited



Squirrel treefrog (*Hyla squirrelella*) on saw palmetto leaf on Peace River tract. (Photo by Faye Winters)

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GLOSSARY

(Including Acronyms and Abbreviations)

Activity Plan. A site-specific plan for the management of one or more resources, e.g. allotment management plan or habitat management plan. Activity plans provide the additional detail necessary to implement decisions made in the Resource Management Plan.

Acquired Land Leases. Federal mineral leases on lands where mineral ownership has been acquired by the federal government from non-federal sources.

Air Quality Classes. Classifications established under the Prevention of Significant Deterioration portion of the Clean Air Act which limits the amount of air pollution considered significant within an area. Class I applies to areas where almost any change in air quality would be significant; Class II applies to areas where the deterioration normally accompanying moderate well-controlled growth would be insignificant; and Class III applies to areas where industrial deterioration would generally be insignificant.

Anticlinal Structures. Geologic deposits having a fold, generally convex upward, whose core contains the stratigraphically older rocks.

Aquifer. A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to be able to yield significant quantities of water to wells and springs.

Archaeological Resources. Sites, areas, structures, objects, or other evidence of prehistoric or historic human activities.

Archaeological Site. Geographic locale containing structures, artifacts, material remains, and/or other evidence(s) of past human activity.

Area of Critical Environmental Concern (ACEC). An area within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Attainment Area. Any area not meeting Ambient Air Quality Standards and designated as such by 17-275.410 F.A.C.

Candidate Species. Candidate species are any species not yet officially listed, but which are undergoing a status review or are proposed for listing according to *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce.

Closed. Designated areas, routes, roads and trails where the use of OHV's is permanently or temporarily prohibited. Use by emergency vehicles and beach maintenance vehicles is allowed.

Confined Aquifer. An aquifer bounded above and below by impermeable beds, or by beds of distinctly lower permeability than that of the aquifer itself; and aquifer containing confined ground water.

Critical Habitat. Any habitat, which if lost, would appreciably decrease the likelihood of the survival and recovery of a threatened or endangered species, or a distinct segment of its population. Critical habitat may represent any portion of the present habitat of a listed species and may include additional areas for reasonable population expansion. Critical habitat must be officially designated by the USFWS or the National Marine Fisheries Services.

Cultural Modification. Any man-caused change in the land form, water form, vegetation, or the addition of a structure which creates a visual contrast in the basic elements (form, line, color, texture) of naturalistic character of a landscape.

Cultural Resource. The fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structure, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

Cumulative Impact. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Disposal. Transfer of ownership of a tract of public land from the United States to another party.

Endangered Species. Any species formally recognized by the USFWS as in danger of extinction throughout all or a significant portion of its range.

Ephemeral Stream. A stream that flows in direct response to surface runoff and is not influenced by ground water sources.

Ephemeral Wetland. Wetlands that periodically do not hold any standing water. In Florida sufficient evidence is available to suggest that ephemeral wetlands support very distinct wildlife communities from permanent wetlands.

Fault Traps. An oil or gas trap in which the closure results from the presence of one or more faults.

Flooding. The temporary covering of the soil surface by water from any source. Shallow water standing during or shortly following rain is excluded from the definition of flooding. Marshes and swamps are excluded from the definition of flooding because water is more than a temporary covering.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579, which gives the BLM legal authority to establish public land policy, to establish guidelines for administering such policy, and to provide for the management, protection, development, and enhancement of public land.

Federal Mineral Ownership (FMO). Lands on which either the entire mineral estate or certain mineral rights are owned by the federal government.

Forest Land. Land carrying forest growth, or if totally lacking, bearing evidence of former forest which contains 10 per cent of more crown cover.

Forest product. Forest products would include any forest land product, including but not limited to timber, plywood, chips, post poles, Christmas trees, greenery, nuts, chemicals, and resins.

Groundwater. Water within the earth that supplies wells and springs.

Habitat. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Hazardous Wastes. Those materials defined in Section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and listed in 40 CFR 261.

Historic. Refers to period wherein non-Native cultural activities, based primarily upon European roots, took place and having no origin in traditional Native American culture(s).

Hydrocarbons. Organic chemical compounds of hydrogen and carbon atoms that form the basis of all petroleum products, including oil and gas.

Interdisciplinary. Characterized by interactive participation or cooperation of two or more disciplines or fields of study.

Intermittent Stream. A stream that does not flow year round but has some association with ground water for surface or subsurface flows.

Leasable Minerals. Those minerals or materials that can be leased from the federal government. Includes oil and gas, coal, phosphate, sodium, potash, and oil shale.

Lease (Mineral). A contract between an owner of mineral rights and another, granting the latter the right to search for and produce gas, hydrocarbons, or other mineral substances upon payment of an agreed upon rental and royalties based on production.

Lease Notice. Provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A lease notice also addresses special items the lessee would consider when planning operations, but does not impose new or additional restrictions.

Lease Stipulations. Additional specific terms and conditions that change the manner in which operation may be conducted on a lease, or modify the lease rights granted.

Locatable Minerals. Minerals or materials subject to disposal and development through the Mining Law of 1872, (as amended). Generally includes metallic minerals such as gold and silver and other materials not subject to lease or sale

(such as some bentonites, limestone, talc, and some zeolites).

National Environmental Policy Act (NEPA) of 1969. Public Law 91-190, which established environmental policy for the nation. Among other items, NEPA requires federal agencies to consider environmental values in decision-making processes.

National Register of Historic Places (NRHP). A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology, and culture, established by the National Historic Preservation Act of 1966 and maintained by the Secretary of the Interior.

No Surface Occupancy (NSO). Use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values. The NSO stipulation includes stipulations which may have been worded as "No Surface Use/Occupancy," "No Surface Disturbance," "Conditional NSO," and "Surface Disturbance or Surface Occupancy Restriction (by location)."

Non-attainment Area. Any area not meeting Ambient Air Quality Standards and designated as such by 17-275.410 F.A.C.

Off-Highway Vehicle (OHV). This term replaces "off-road vehicle (ORV)", and means any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain.

Open. Designated areas, routes, roads, and trails where unrestricted OHV use may occur (subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343 and 161.053 and 161.58 F.A.C.).

Outstanding Florida Waters. Waters designated by the Florida Environmental Regulation Commission as worthy of special protection

because of their natural attributes (17-302.200 (16) F.A.C.).

Outstanding National Resource Waters. Waters designated by the Florida Environmental Regulation Commission that are of such exceptional recreational or ecological significance that water quality should be maintained and protected under all circumstances, other than temporary lowering and the lowering allowed under Section 316 of Federal Clean Water Act (17-302.200 (17) F.A.C.).

Potentiometer. An electrical instrument for the precise measurement of low-level direct-current voltages.

Potentiometric Surface. The level to which water will rise in tightly cased wells that penetrate an aquifer.

Prehistoric. Refers to period wherein Native American cultural activities took place which were not yet influenced by contact with historic non-Native culture(s).

Prime Farmland. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water).

Public Domain. Public lands which were originally (that is upon the admittance of a state to the United States) owned the federal government and have since that time remained in continuous federal ownership.

Public Domain Leases. Federal mineral leases of mineral interests which were originally (that is upon the admittance of a state to the United States) owned the federal government and have since that time remained in continuous federal ownership.

Reasonably Foreseeable Development (RFD). A description of anticipated future development of minerals or other resources, used as a basis for assessing the environmental impacts of RMP decisions.

Recreation Opportunity Spectrum (ROS). A continuum used to characterize recreation opportunities in terms of setting, activity, and experience opportunities. The spectrum contains six classes: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Rural, Urban, Residential Beach.

Recreation and Public Purposes (R&PP). Refers to both the Recreation and Public Purposes Act (43 USC 869 (a)) and the uses to be made of public land transferred under the act. The objective of the R&PP Act is to meet the needs of state and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purposes uses. Examples of uses made of R&PP lands are parks, schools, religious facilities, and camps for youth groups. Transfer of land ownership under the provisions of the R&PP Act is referred to as R&PP conveyance.

Residential Beach Community. A residential area adjacent to a beach that is not within the corporate limits of a city, town, or municipality.

Resource-Based Outdoor Recreation. Resource-based outdoor recreation is dependent on some particular element or combination of elements in the natural or cultural environments. Examples would be hunting, fishing camping, boating, and studying nature.

Right-of-Way. The public or federal land authorized to be used or occupied pursuant to a right-of-way grant.

Right-of-Way Grant. A document authorizing the use of public or federal lands for the construction, operation, maintenance, and termination of a project (e.g., utility line, road).

Riparian. Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow rooted in the water table of streams, ponds, and springs.

Riparian Area. Riparian areas are a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

Salable Minerals. Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are common varieties of sand, stone, gravel, and clay.

Scoping Process. An early and public process for determining the nature, significance, and range of issues to be addressed related to a proposed action.

Segregation. The removal for a limited period, subject to valid existing rights, of a specified area of the public lands from the operation of the public land laws, pursuant to the exercise by the Secretary of the Interior of regulatory authority as conferred by law to allow for the orderly administration of the public lands.

Sensitive Species. Species that are not yet listed as endangered or threatened, but that are undergoing a status review. This may include species whose populations are consistently and widely dispersed or whose ranges are restricted to a few localities, so that any major habitat change could lead to extinction. A species that is particularly sensitive to some external disturbance factors.

Short Tons. A unit of measurement equal to 2,000 pounds, or 0.907 metric ton.

Significance. A high degree of importance as indicated by either quantitative measurements or

qualitative judgments. Significance may be determined by evaluating characteristics pertaining to location extent, consequences, and duration.

Soil Association. A mapping unit used on general soil maps in which two or more defined taxonomic units occurring together in a characteristic pattern are combined because the scale of the map or the purpose for which it is being made does not require delineation of the individual soils.

Special Recreation Management Area (SRMA). An area where special management or intensive recreation management is needed. Recreation activity plans are required, and greater managerial investment in facilities or supervision can be anticipated.

Special Status Species. Wildlife and plant species either federally listed or proposed for listing as endangered or threatened, state-listed or BLM-determined priority species.

Split-Estate Lands. A given land area where the surface and mineral estates are in different ownerships. Most often split-estate areas occur where the surface is owned by private individuals, corporations, or groups or by state or local government, and the minerals are federally owned.

Structural Anomalies. Dome-shaped features in the (reservoir) rocks of the earth's subsurface that are prone to accumulated oil and gas deposits.

Surface Managing Agency (SMA). An agency of the federal government which has the primary responsibility for management of a particular area of land, such as the Forest Service, National Park Service, the Navy, Air Force, or the BLM.

Surficial. Pertaining to or lying in or on a surface the surface of the earth; e.g. "surficial weathering" of a rock, or a "surficial structure" formed by creep.

Surficial Aquifer. These aquifers consist of sand and shell deposits with uppermost layers contiguous with the land surface.

Thermal Maturation. Process of temperature increase in the earth's subsurface necessary for the generation of oil and gas from source rocks.

Threatened Species. Any species formally recognized by the USFWS as likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Unclassifiable Areas. These are areas which, because of the lack of data, cannot be classified as Attainment or Non-attainment Areas with respect to air quality standards.

Undifferentiated Aquifers. Un-named surficial and intermediate water bearing units that are important sources of water locally where other aquifers do not contain potable waters.

Unique Farmland. Unique farmland is land other than prime farm land that is used for the production of specific high value food and other fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, fruit, and vegetables.

User-Oriented Outdoor Recreation. User-oriented outdoor recreation can be provided almost anywhere for the convenience of the user. Examples of user-oriented outdoor recreation would be golf, tennis, baseball, archery, skeet, and playground activities.

Visual Resource Management (VRM). The planning, designing, and implementation of management objectives for maintaining scenic value and visual quality on public lands.

Visitor Use Days (VUDs). A measure of the amount of recreational use. In this document, a VUD is calculated by estimating the amount of time one person participated in a recreation activity, multiplied by the estimated number of visitors to a specific tract, and divided by the number of hours in a day that individuals would be expected to go to the tract.

Wetlands. Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Withdrawal. A formalized action restricting specified land from operation or disposal under specified laws, either mineral laws or land disposal laws, or both. Can also be used to transfer jurisdiction of land to another federal agency.

Woodland. Forest land on which trees are present but form only an open canopy, the intervening areas being occupied by lower vegetation. Forest lands which produce or are capable of producing no more than 20 cubic feet per acre per year of commercially important tree species.

Acronyms and Abbreviations

ACEC	- Area of Critical Environmental Concern
AMC	- American Mining Congress
APD	- Application for Permit to Drill
BOP	- Blowout Preventor
CFR	- Code of Federal Regulations
CSU	- Controlled Surface Use
DEIS	- Draft Environmental Impact Statement
DRI	- Development of Regional Impact
EA	- Environmental Analysis
EIS	- Environmental Impact Statement
F.A.C.	- Florida Administrative Code
FPC	- Florida Phosphate Council
FMO	- Federal Mineral Ownership
GIS	- Geographic Information Systems
IMC	- International Mineral and Chemical Corporation
NOA	- Notice of Availability
NOI	- Notice of Intent
NRHP	- National Register of Historic Places
NRI	- National Rivers Inventory
NSO	- No Surface Occupancy
OHV	- Off-Highway Vehicle
PSD	- Prevention of Significant Deterioration
RMP	- Resource Management Plan
ROD	- Record of Decision
ROS	- Recreation Opportunity Spectrum
SCORP	- State Comprehensive Outdoor Recreation Plan
SHPO	- State Historic Preservation Office(r)
SIP	- State Implementation Plan (Air Quality)
SMA	- Surface Managing Agency
VRM	- Visual Resource Management

U.S. Government Agencies

BIA	- Bureau of Indian Affairs
BLM	- Bureau of Land Management
COE	- Army Corps of Engineers
EPA	- Environmental Protection Agency
USBM	- Bureau of Mines
USCG	- Coast Guard
USFS	- Forest Service
USFWS	- Fish and Wildlife Service
USGS	- Geological Survey
USSCS	- Soil Conservation Service

Florida Agencies

FGFWFC- Florida Game and Freshwater Fish Commission
FLDA - Department of Agriculture
FLDEP - Department of Environmental Protection
FLDER - Department of Environmental Regulation
FLDF - Department of Forestry
FLDNR - Department of Natural Resources
SHPO - State Historic Preservation Office
SWFWMD-Southwest Florida Water Management District
TBRPC - Tampa Bay Regional Planning Council

Laws

CERCLA- Comprehensive Environmental Response, Compensation and Liability Act
FLPMA - Federal Land Policy and Management Act of 1976
NEPA - National Environmental Policy Act of 1969
NHPA - National Historic Preservation Act of 1966, as amended through 1992
R&PP - Recreation and Public Purposes Act
RCRA - Resource Conservation and Recovery Act

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Introduction

The Florida RMP/EIS was prepared by a team of specialists from the Jackson District Office, with support and review from the BLM Denver Service Center and Eastern States. The members of this team are listed below.

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Andrea Nygren, Program Analyst. Responsible for general review.

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Deborah K. Rawhouser, Outdoor Recreation Planner. Responsible for review of alternatives and impacts, and review of recreation, cultural, wild and scenic rivers, and wilderness sections.

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Bea Wade, Planning and Environmental Coordinator. Responsible for overall coordination of Eastern States review.

Service Center

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Mary Beth Stultz, GIS Specialist. Provided training and technical assistance for GIS analysis.

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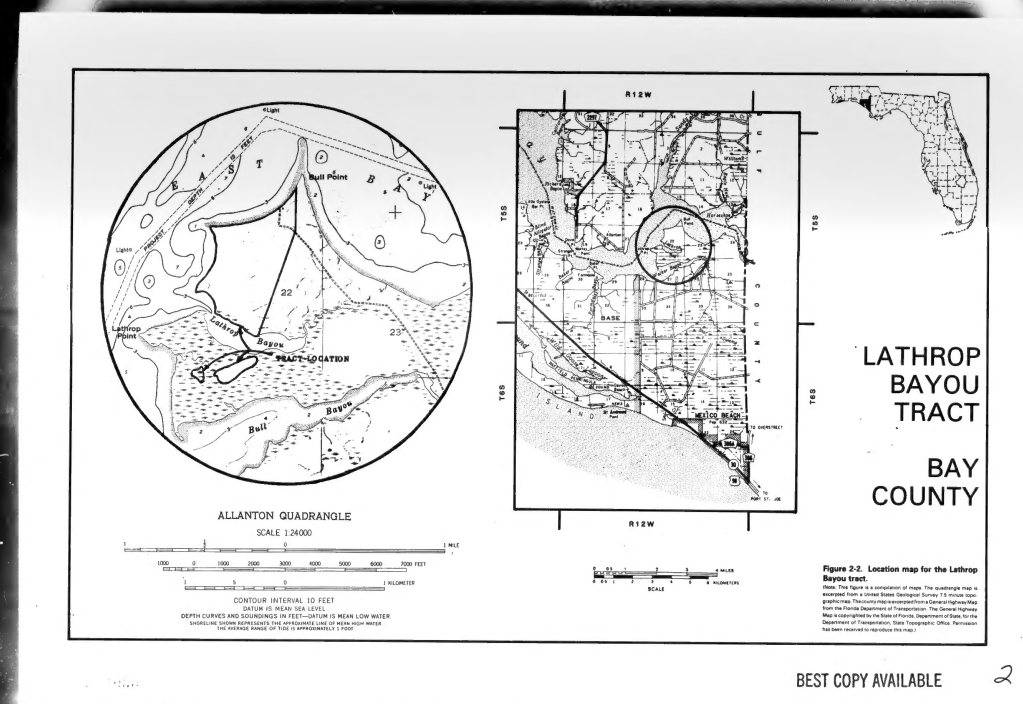
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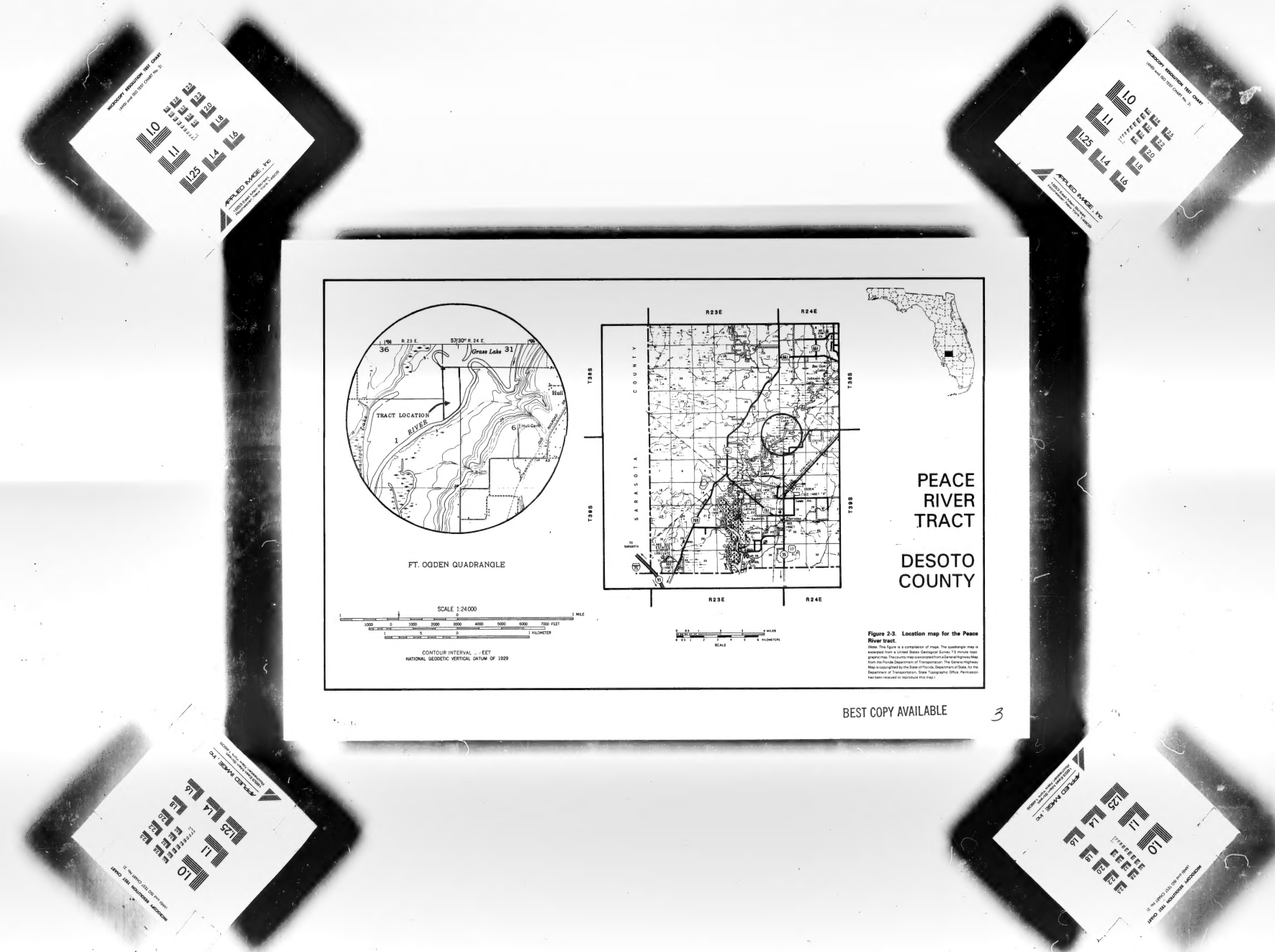
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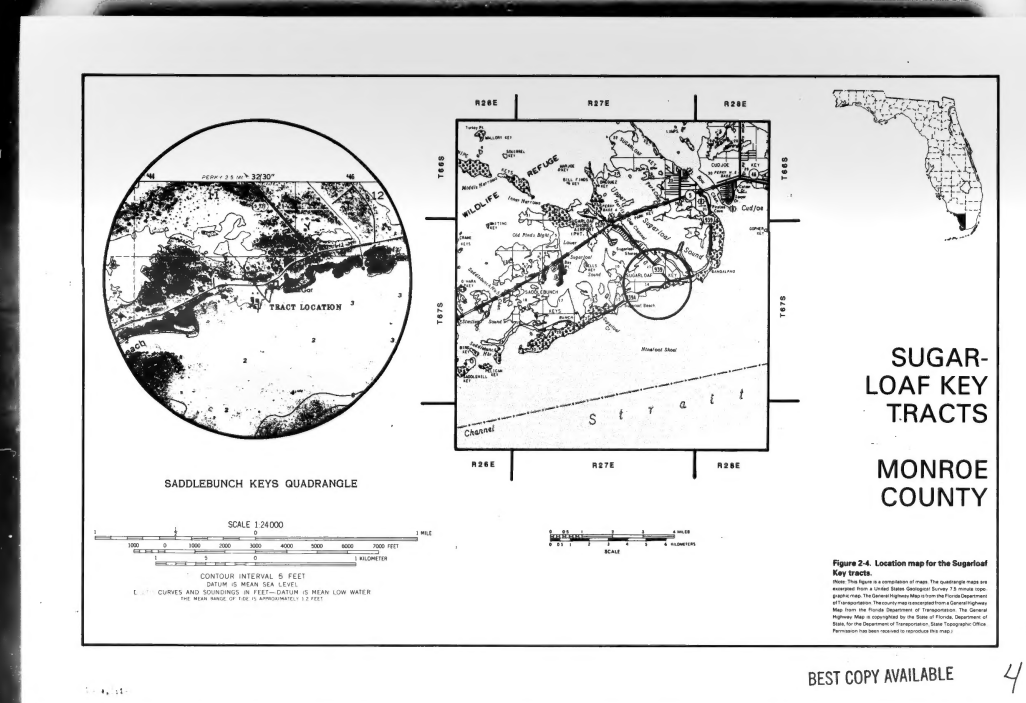
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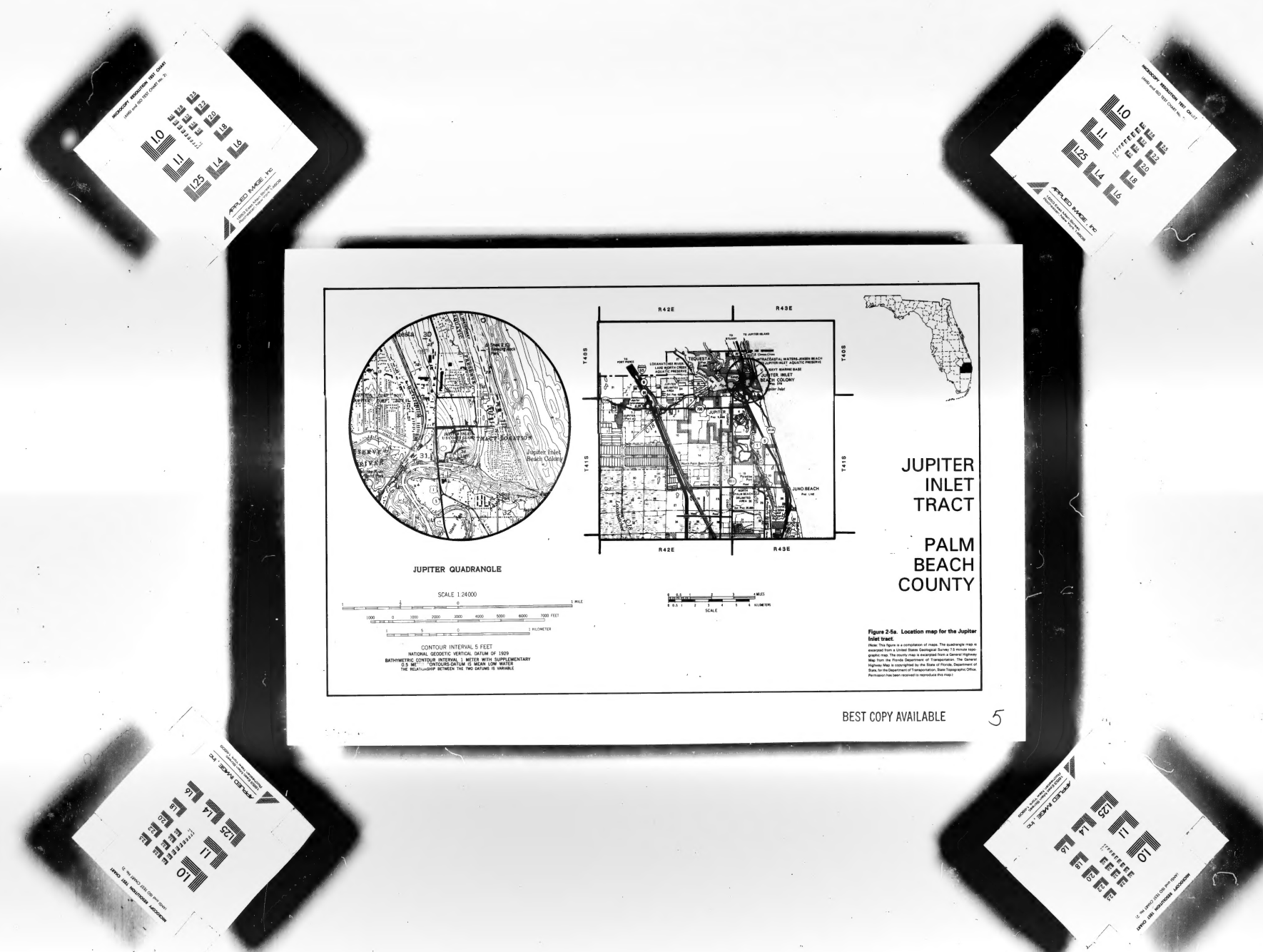
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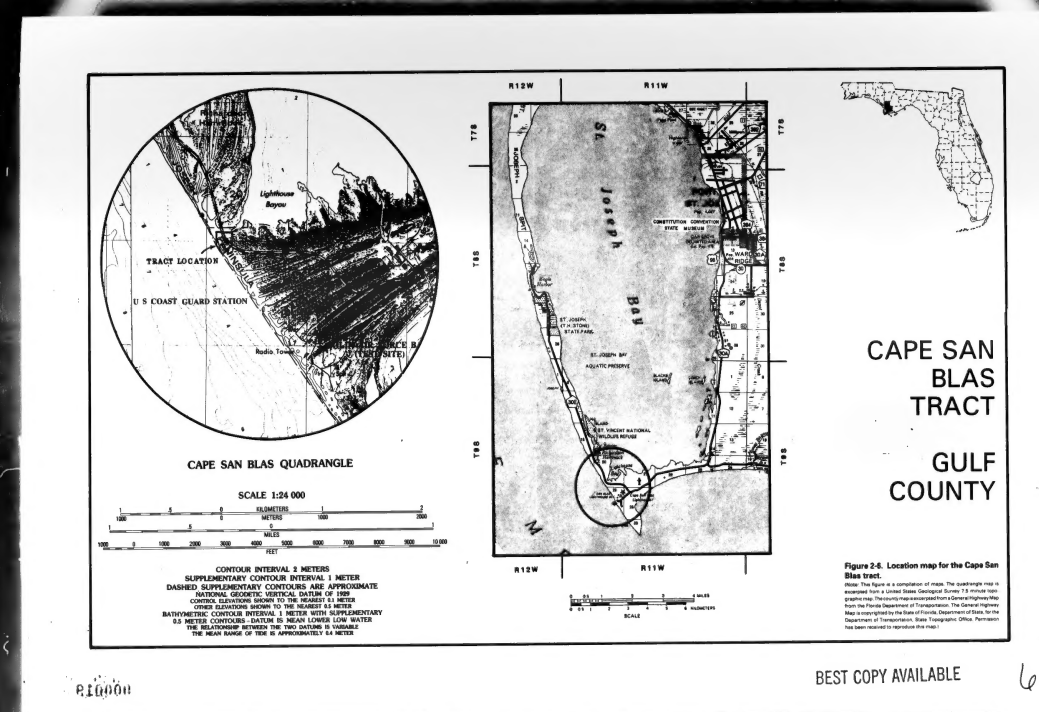
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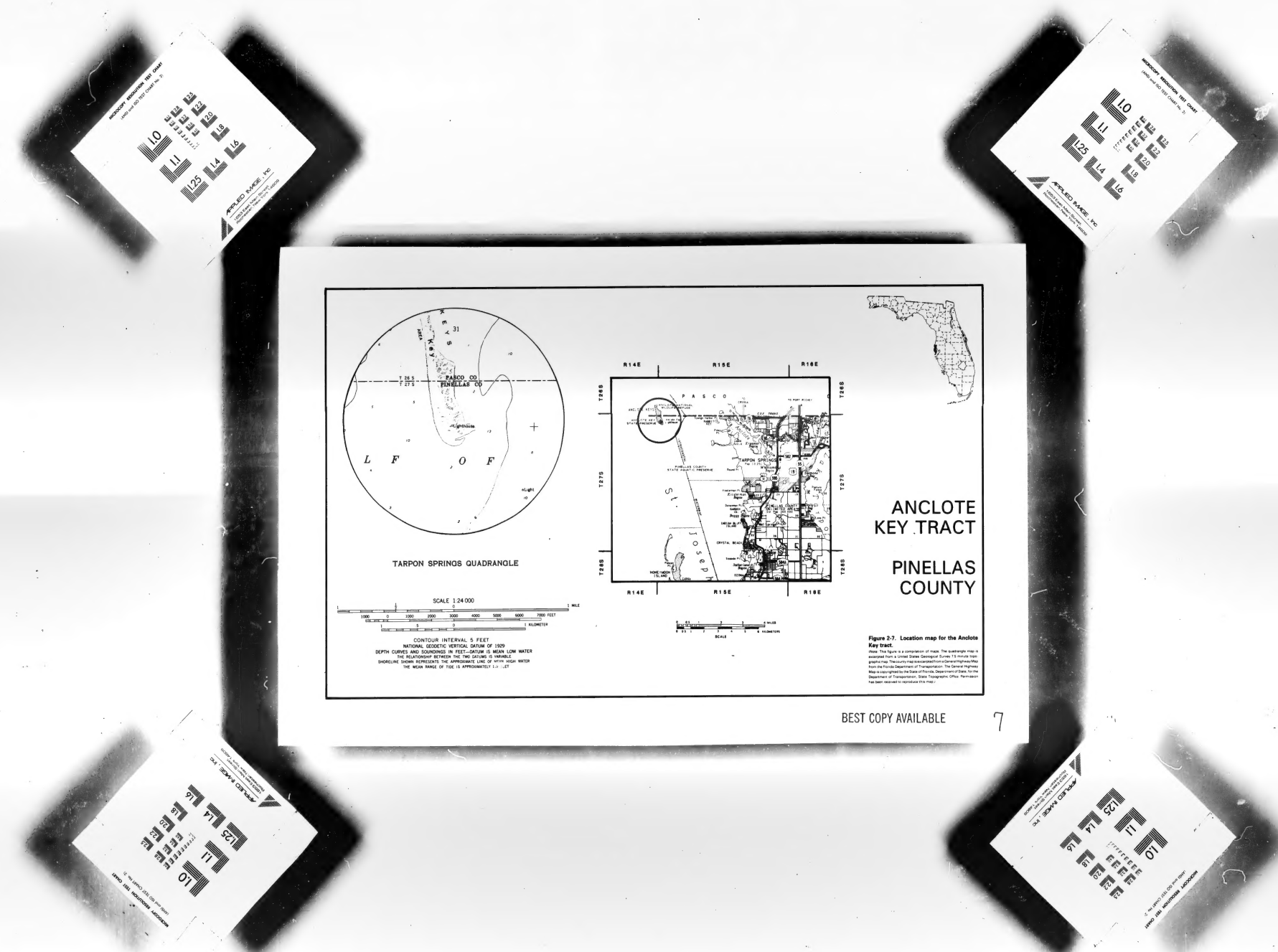
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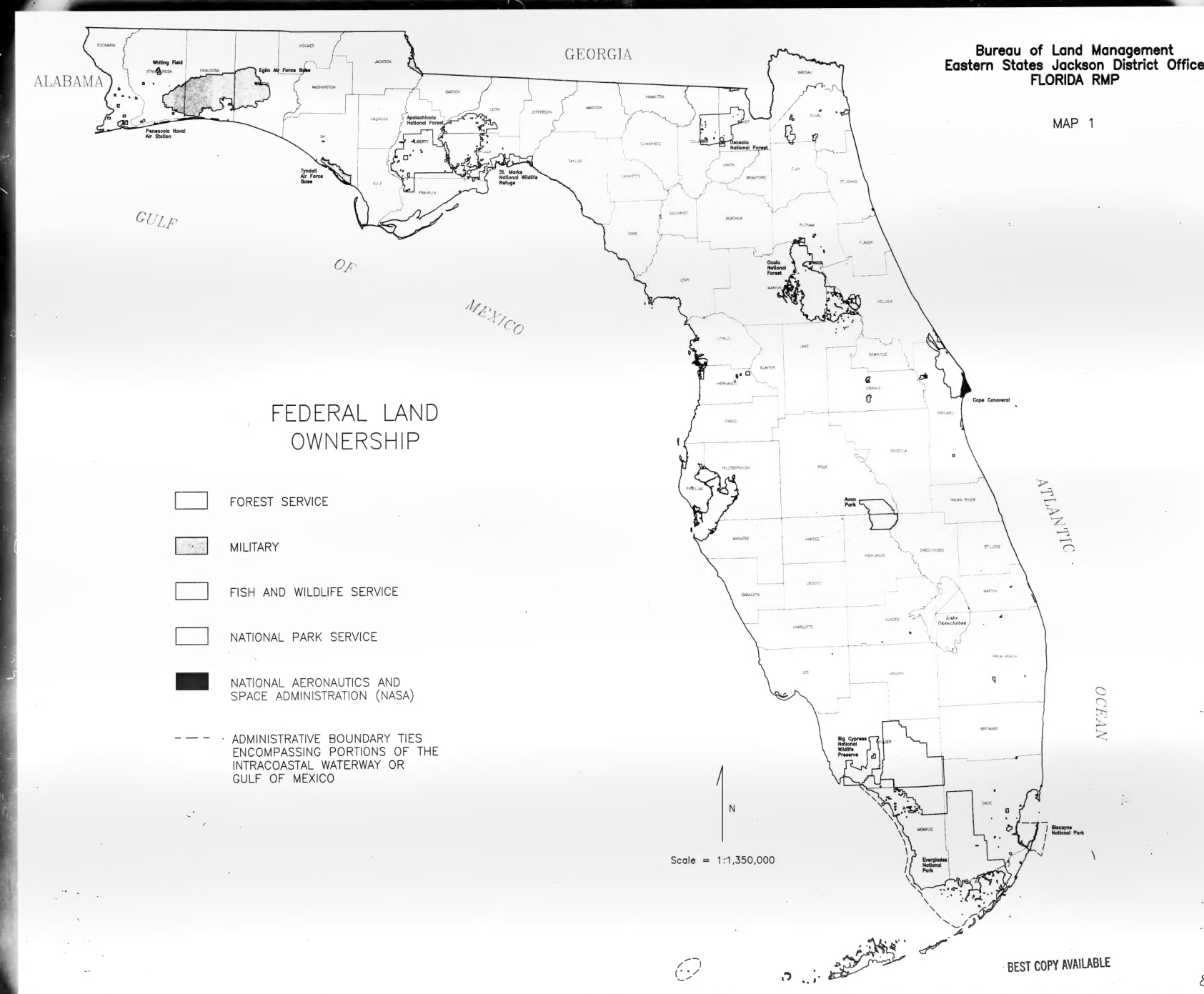
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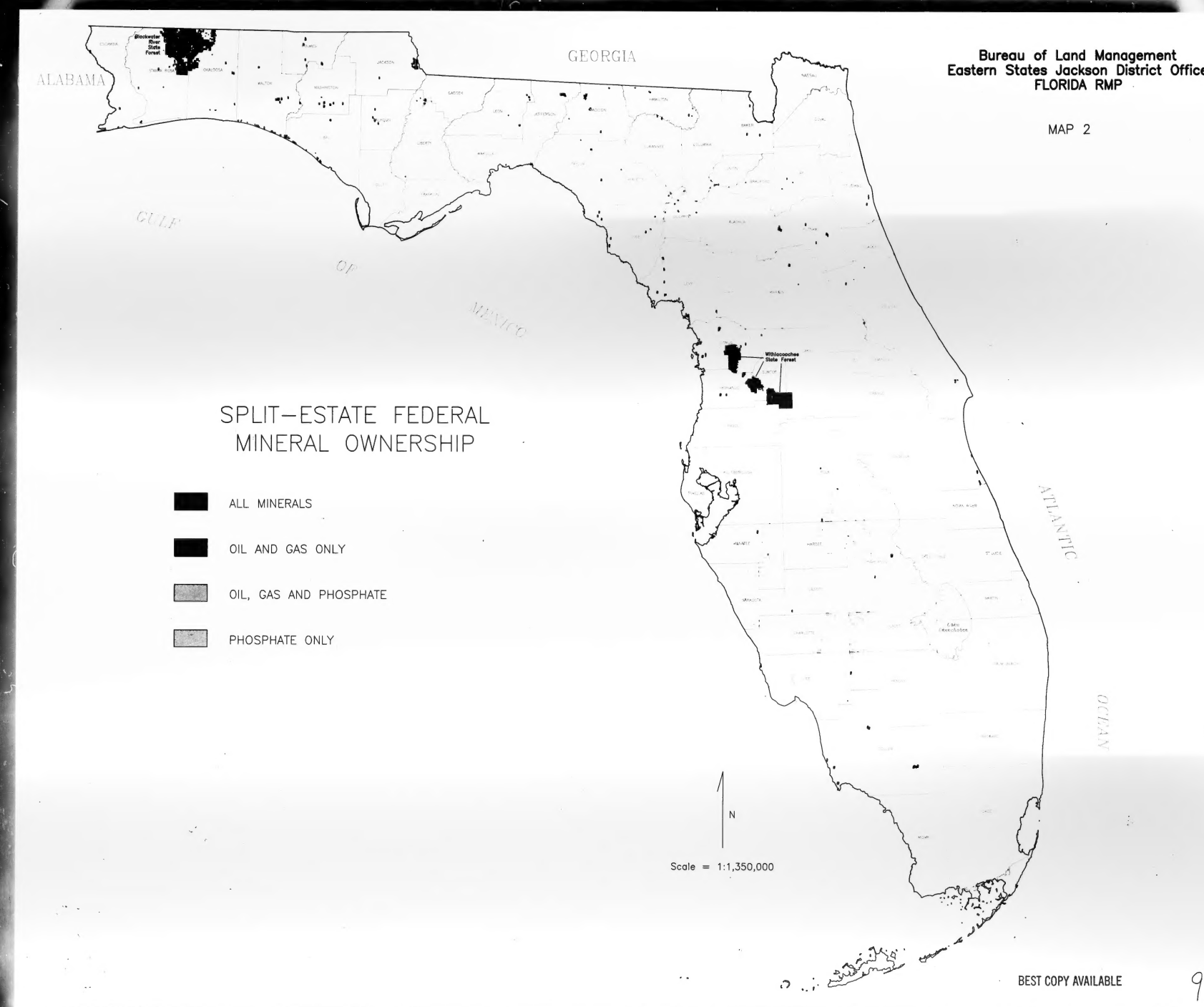
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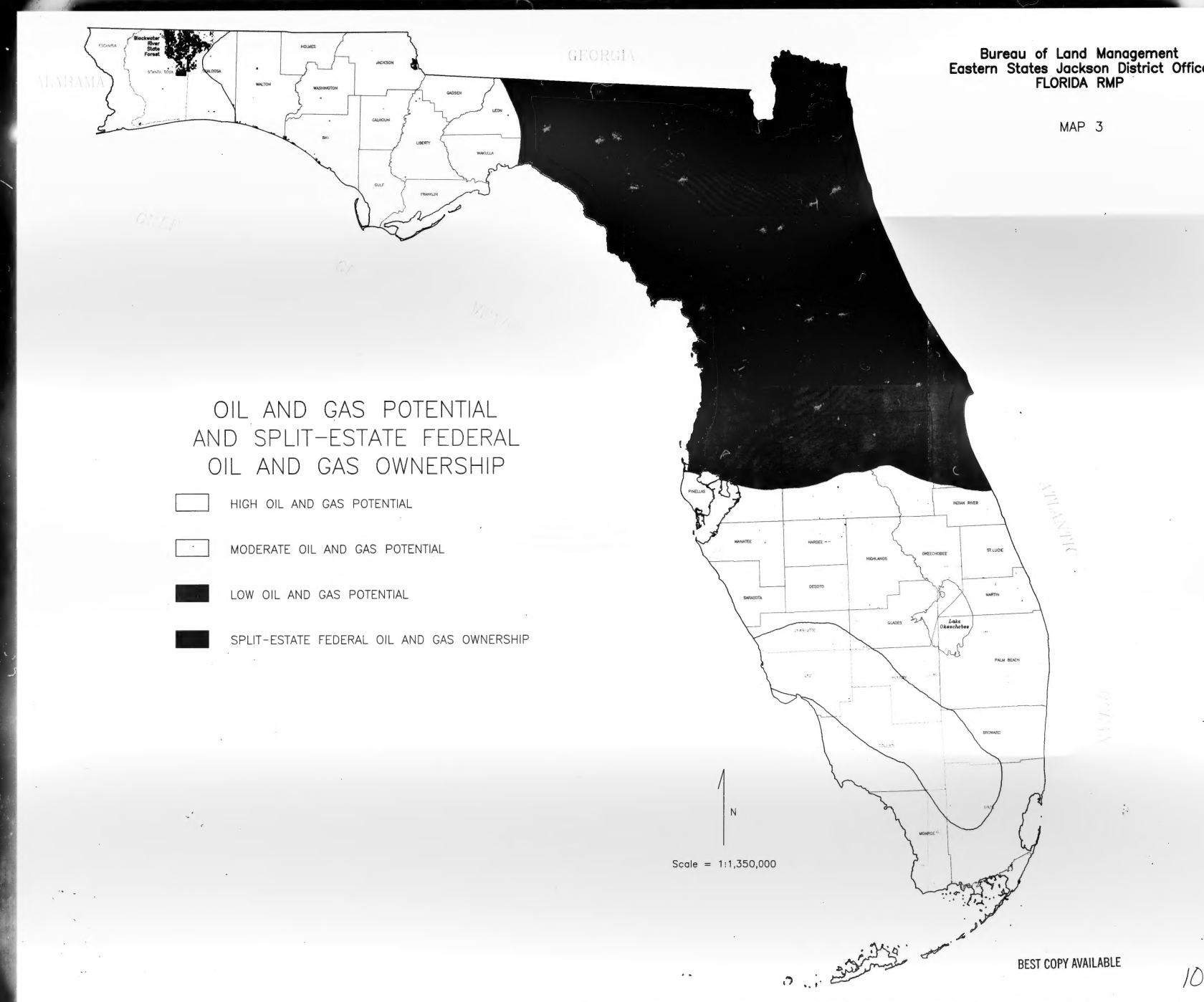
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STATES... BUREAU OF LAND MANAGEMENT...
U.S. DEPARTMENT OF THE INTERIOR... JUNE 1995

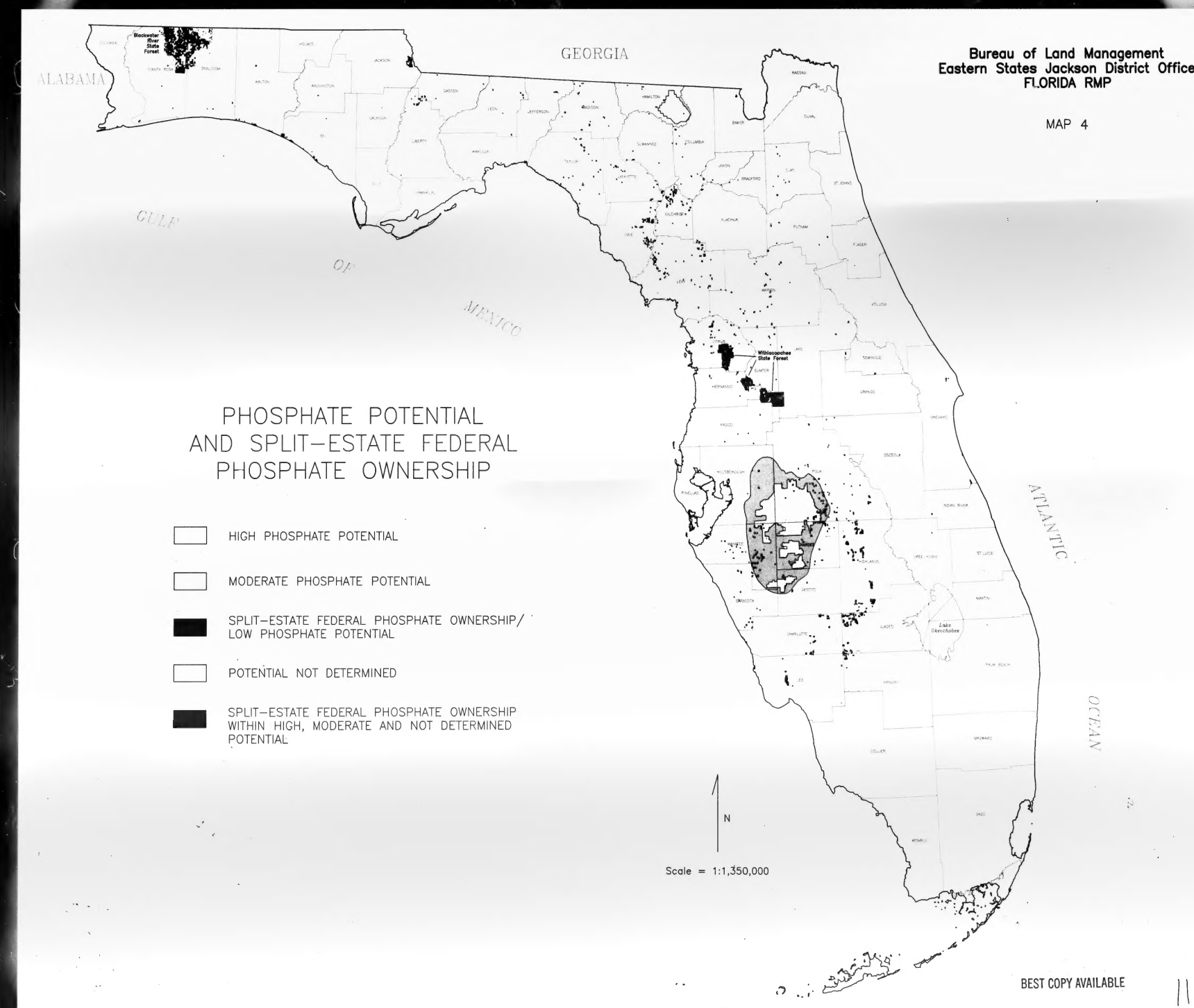
12 OF 17
12.5X
SUPTDOCS/GPO
MAP 10



I 53.2:F 66

FLORIDA... RESOURCE MANAGEMENT PLAN AND
RECORD OF DECISION... JACKSON DISTRICT, EASTERN
STATES... BUREAU OF LAND MANAGEMENT...
U.S. DEPARTMENT OF THE INTERIOR... JUNE 1995

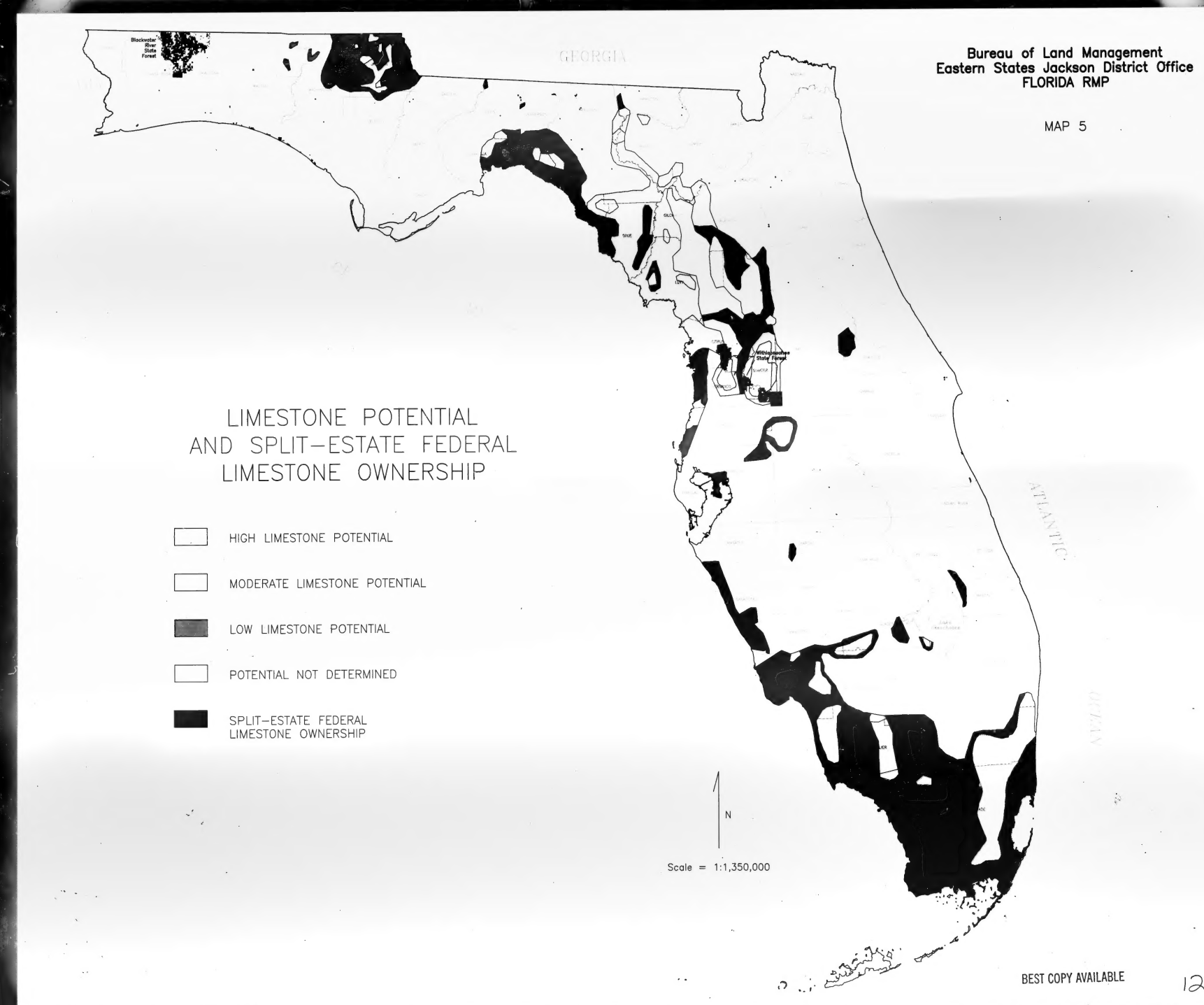
13 OF 17
12.5X
SUPTDOCS/GPO
MAP 11



I 53.2:F 66

FLORIDA... RESOURCE MANAGEMENT PLAN AND
RECORD OF DECISION... JACKSON DISTRICT, EASTERN
STATES... BUREAU OF LAND MANAGEMENT...
U.S. DEPARTMENT OF THE INTERIOR... JUNE 1995

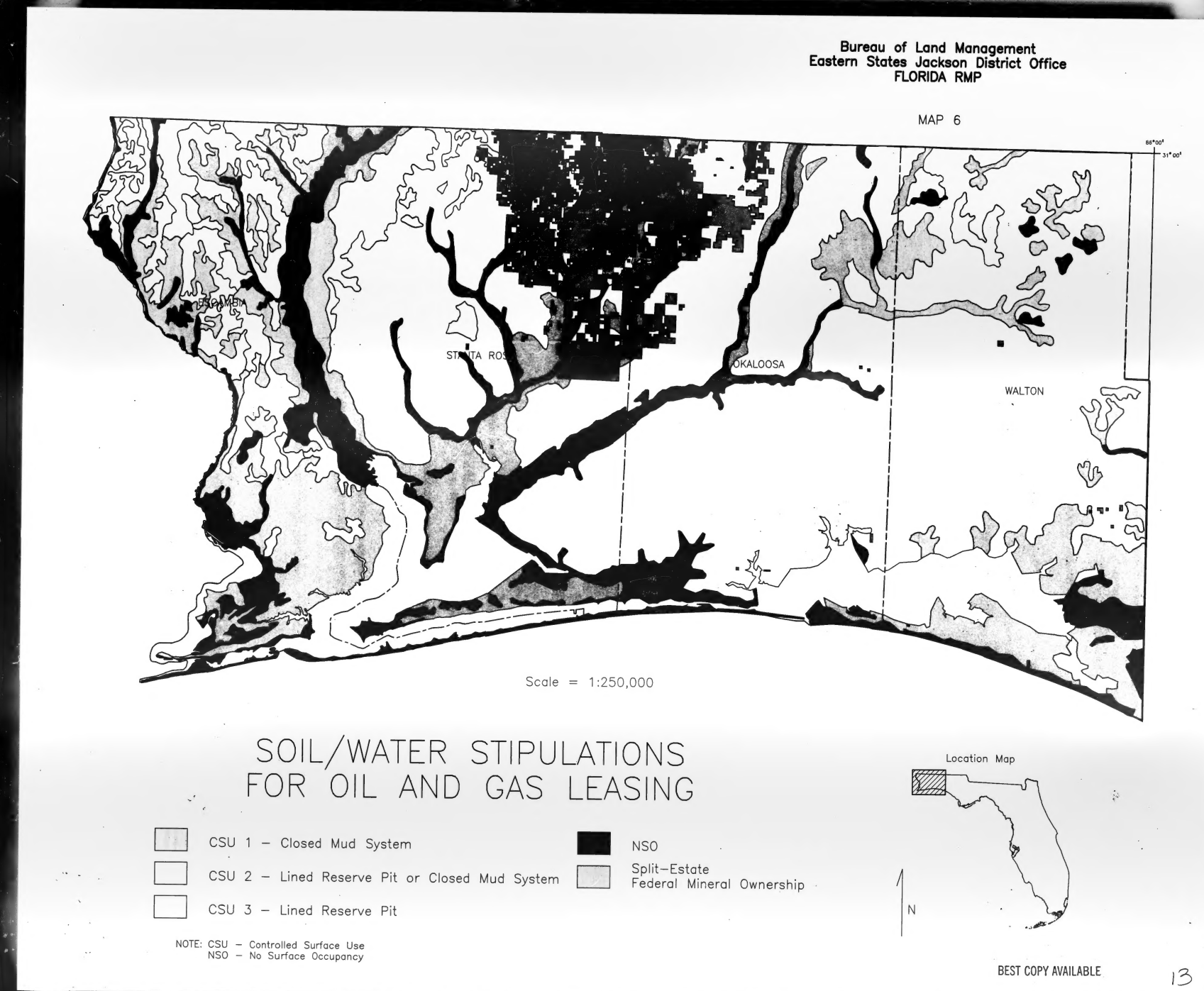
14 OF 17
12.5X
SUPTDOCS/GPO
MAP 12



I 53.2:F 66

FLORIDA... RESOURCE MANAGEMENT PLAN AND
RECORD OF DECISION... JACKSON DISTRICT, EASTERN
STATES... BUREAU OF LAND MANAGEMENT...
U.S. DEPARTMENT OF THE INTERIOR... JUNE 1995

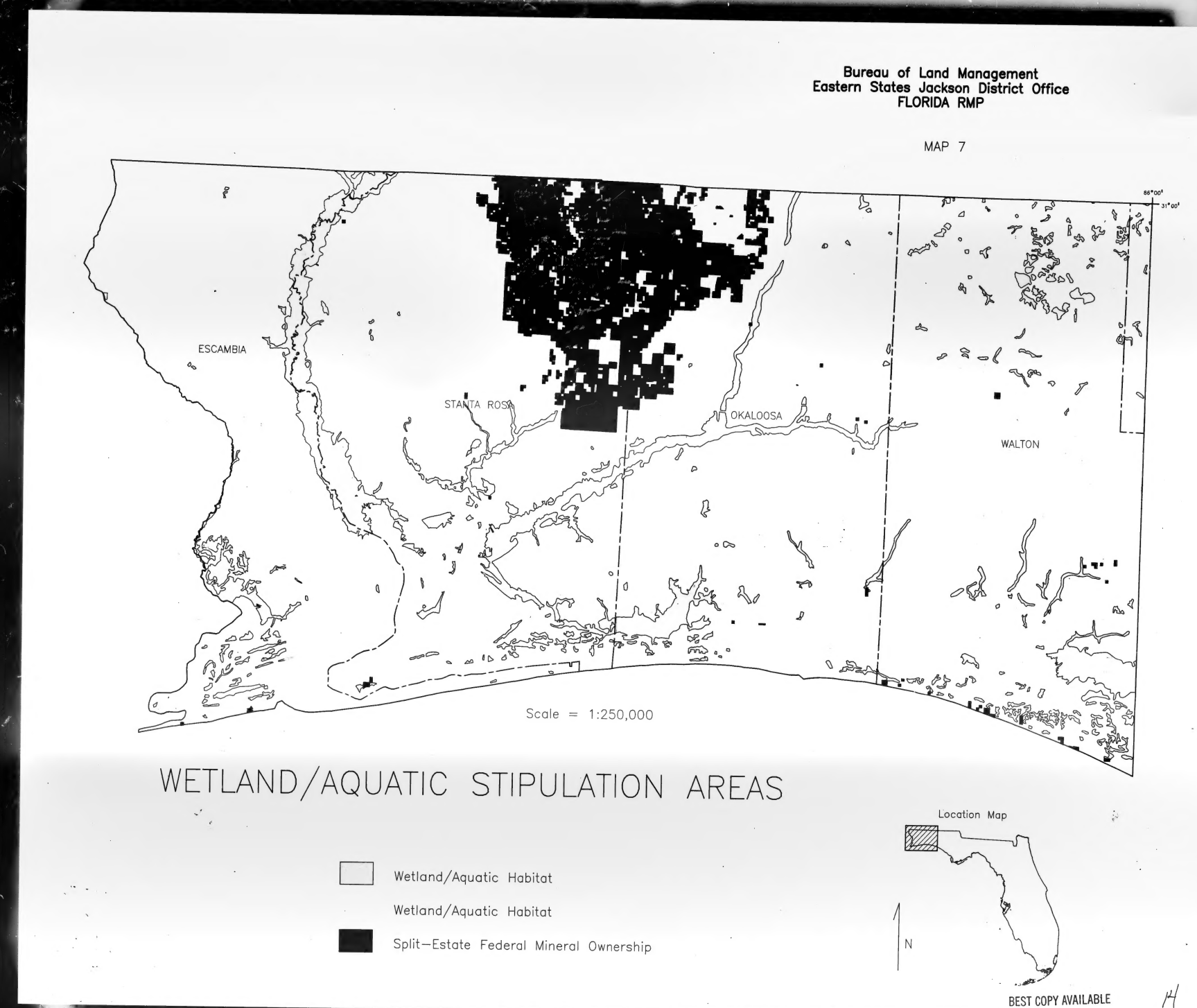
15 OF 17
12.5X
SUPTDOCS/GPO
MAP 13



I 53.2:F 66

FLORIDA... RESOURCE MANAGEMENT PLAN AND
RECORD OF DECISION... JACKSON DISTRICT, EASTERN
STATES... BUREAU OF LAND MANAGEMENT...
U.S. DEPARTMENT OF THE INTERIOR... JUNE 1995

16 OF 17
12.5X
SUPTDOCS/GPO
MAP 14



I 53.2:F 66

FLORIDA... RESOURCE MANAGEMENT PLAN AND
RECORD OF DECISION... JACKSON DISTRICT, EASTERN
STATES... BUREAU OF LAND MANAGEMENT...
U.S. DEPARTMENT OF THE INTERIOR... JUNE 1995

17 OF 17
12.5X
SUPTDOCS/GPO
MAP 15

